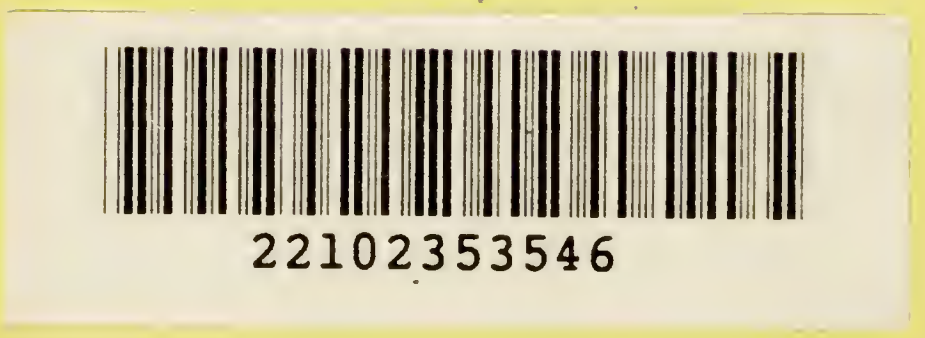

MISCELLANIES.

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BY

JOHN ADDINGTON SYMONDS, M.D.,

SELECTED AND EDITED,

WITH AN INTRODUCTORY MEMOIR,

BY HIS SON.

LONDON: MACMILLAN AND CO.

BRISTOL: I. ARROWSMITH.

1871.

EDITOR'S PREFACE.

In preparing the following Volume for the Press I have found it difficult to make such a selection of my father's works as should interest the general public, and at the same time do justice to his professional and scientific reputation. To combine in one book a Treatise on Æsthetics, with a Course of Lectures on Headache, or an Analytical Essay upon Tetanus would have been impossible. The only course open to me, therefore, was to omit all strictly medical articles, confining myself to works of pure literature, and to such scientific studies as had a general philosophical or social interest. I am aware that by following this principle of selection I have rendered the Volume less valuable to physicians; but I have the satisfaction of reflecting that more public attention may be attracted to the products of a singularly versatile and elegant, as

well as powerful and scientific intellect. The few Poems and Translations inserted at the end of the Volume have been selected from a great number of equal merit, as specimens of the lighter literary recreations which occupied the intervals of leisure in a very laborious life.

CLIFTON, *July* 1871.

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MEMOIR.

1807—1831.

JOHN ADDINGTON SYMONDS was born at Oxford on the 10th of April, 1807. His father, who belonged to a family of old standing and respectability in *Shropshire and Warwickshire, had settled in that city as a medical practitioner after marrying Miss Mary Williams, of a family established at Aston, in the county of Oxford. This circumstance determined the future career of his son, who received his earliest education at Magdalen College School. There he showed such aptitude for classical studies, and so strong a bent toward literature, that, had it not been decided for him to pursue his father's profession, he would naturally have devoted his abilities to the Church, or have become the Fellow of an Oxford College. The development of his intellectual powers was rapid. At the age of sixteen, having already made himself a fair Greek and Latin scholar, and laid the foundation of those classical tastes which he retained through life, he commenced the study of medicine, attending the anatomical courses of Dr. Kidd, and the lectures on chemistry of Dr. Daubeny, and acting meanwhile as dresser at the Radcliffe Infirmary to Mr. Hitchings. In 1825 he entered the University of Edinburgh,

* The immediate ancestors of Dr. Symonds had been settled for about a century in Kidderminster, whither they had removed from Shrewsbury. They claimed a common descent with the family of Symons or Symeon, of Pyrton, the heiress of which branch married John Hampden.

where he graduated as M.D. in 1828. At Edinburgh he was distinguished among his fellow students for the union of literary tastes and pursuits with an unflinching devotion to the studies of his profession. The time that he could spare from science was spent upon philosophy and poetry. While toiling night and day in the fever wards of the hospital, or mastering by long hours of practice and patient observation the then novel art of the stethoscope,* he was among the first admirers of Shelley, and foremost in all discussions relating to elegant literature. Many pieces of poetry composed by him at this period shew him to have been a master of facile and vigorous versification. At the same time he neglected neither the graver studies in pathology and anatomy which were necessary for his professional training, nor literary reading of a more robust and bracing type than poetry. The soundness of judgment and logical precision with which he was eminently gifted by nature, and the industry of research which made his diagnosis valuable in all the more complicated cases of disease, were being confirmed and exercised by the perusal of Bacon, Dugald Stewart, and Dr. Brown, his three favourite philosophers. For this unusual combination of philosophical and literary ability, with practical sagacity and wisdom in the discovery and treatment of disease, he continued to be celebrated through his lifetime, forming, as it were, a link between his profession and the world of letters, and carrying on the tradition of the Sydenhams and the Harveys of whom England is justly proud.

1831—1851.

But it was requisite that he should suppress as far as possible the inclinations of his genius toward extraneous studies, and concentrate his powers upon the practice of medicine. Accordingly,

* I have often heard my father say that whatever skill in auscultation he possessed was due to his having learned the use of the stethoscope by original experiment and observation, and not by tradition.

after taking his degree, he returned to Oxford, and took an active part in his father's practice until 1831, when he removed to Bristol at the instance of his great uncle, Mr. John Addington, of Ashley Court, near that city. The whole country at that period was agitated with the disturbances that attended the passing of the Reform Bill. It was a time at which political feuds raged high, especially in Bristol, an essentially Tory city, provoked almost to madness by the terror of its riots. Dr. Symonds was by connections and conviction a Liberal. In voting and in expressing his opinions he did not depart from his principles, though, as a young professional man, he had to fight an uphill way at first and to conquer some political antagonism.* His talents, however, won for him from the date of his first residence in Bristol an eminent position among his brethren. He was soon elected Physician to the General Hospital and Lecturer on Forensic Medicine at the Bristol Medical School. The latter post he exchanged in 1836 for the Lectureship on the Practice of Medicine, which he held till 1845; and in 1848, after resigning his place at the Hospital, in consequence of the increase of his private practice, he was elected its Honorary and Consulting Physician.

In 1834 Dr. Symonds married Harriet, the eldest daughter of James Sykes, Esq., by whom he had five children, four of whom survive.† His married life was but brief; for in 1844 his wife died at the time when he had successfully ended the first stage in his life's journey, and was looking forward to years of undiminished activity but of less anxiety. With words so few and cold as these it is best perhaps to pass over the great joy and the great sorrow

* He used to tell, in after life, that on voting at the first contested election after he came to Bristol, an older physician than himself had vainly warned him that he would destroy his professional prospects if he ventured to assert his right to think for himself in politics.

† Edith Harriet, wife of Charles D. Cave, Esq., of Stoneleigh House, Clifton; Mary Isabella, wife of Sir Edward Strachey, Bart., of Sutton Court, Somersetshire; John Addington Symonds, of Clifton Hill House, Bristol; and Charlotte Byron, wife of T. H. Green, Esq., of Balliol College, Oxford.

of a man whose whole existence was one of unremitting energy and noble toil. Happiness rarely comes to those who seek it eagerly or hug it anxiously. Dr. Symonds was happy, in spite of what he lost and never could forget, because he lived for duty. Those who knew him best will understand that this is no merely conventional panegyric, but the simple fact.

During the first years of his residence in Bristol, and before his practice had become too engrossing, Dr. Symonds employed much of his time in writing. He used to rise early in the morning, and to gain two hours for composition before he began the routine of the day with a breakfast at eight o'clock. The articles on "Age" and "Death," which he contributed to the "Cyclopædia of Anatomy and Physiology," and that on "Tetanus," which was published in the "Cyclopædia of Practical Medicine," were written at this period. So also were several articles composed for Dr. Tweedie's "Library of Medicine," among which may be mentioned the "Pathological Introduction," as well as various contributions to "The British and Foreign Medical Review," and to the "Transactions of the Provincial Medical Association." Most noticeable among his reviews was a paper on "Carswell's Elementary Forms of Disease," while memoirs on the "Cholera in Bristol in 1832," on "The Medical Topography of Bristol," and on similar topics of local interest, attracted much attention. Few of these compositions have more than a professional or strictly scientific value. Yet such of them as can be read with profit by the general student display the forcible and polished style which Dr. Symonds commanded. Some passages from the essays upon "Age" and "Death" are eloquent in a literary sense, and might well have been included in the volume to which this memoir serves as preface. The whole series, if collected, would serve as a model for young writers upon scientific subjects in respect of logical sequence of thought, lucid arrangement, and propriety of diction.

Gradually, while the cares attending his first steps in professional life began to diminish, and he felt that he might again indulge

his strong bias to literary study, new phases of intellectual interest and enjoyment dawned upon him. The friendship of Dr. Prichard, and the society of the Carpenter family, then united under one roof in Bristol, had furnished him with sources of congenial recreation and improvement ever since he first settled in Bristol. But towards the year 1840,* the close intimacy which he formed and maintained with Dr. G. D. Fripp, with Professor F. Newman, with the Rev. Whitwell Elwin, with John Sterling, and with the gifted and accomplished Mrs. Strachey, all then resident in Bristol and Clifton, or frequent visitors to the neighbourhood, tended to foster his old enthusiasm for pure literature, and to develop a taste for art which had hitherto been dormant. It is not often that a man past thirty finds a whole fresh field of intellectual enjoyment suddenly expand before him. Yet this was the good fortune of Dr. Symonds, who discovered at this period that pictures, statuary, engravings, and all forms of art possessed the highest attraction for his intellect. That no mere momentary fancy, but a deeply seated instinct of his nature was satisfied by the study of the fine arts, is evident from the rare æsthetical capacity displayed in the first essay of the following selection. It was about this time that he began to collect prints and books on art, forming a choice library of reference and filling his portfolios, without, however, being bitten by the mere collector's mania for rarities. I have often heard him say how Sterling, walking rapidly along the Clifton streets with neck slightly bent and swinging step, would hail his carriage to tell or hear of some fresh acquisition in the shape of a line engraving or a copy of some coveted old volume.

The richness of Dr. Symonds' mind was shewn in nothing more than his aptitude for forming new tastes and cultivating faculties which had lain undeveloped in his nature. In order to illustrate this fertility and energy of intellect, I will cast a rapid glance over

* I give this as an approximate date to mark the period I wish to indicate though some of the friendships to which I allude were of earlier and some, perhaps, of later formation.

the succession of his favourite pursuits from this time forward till his death. After appropriating the beauties of Italian and Greek art, he next engaged in the study of Egyptian antiquities. I can well remember returning from Harrow, where I was at school, on several successive holidays, to find him deep in Rosellini and Bunsen, examining the chronology of Manetho, learning the names and attributes of the several gods and of the royal dynasties, and entering with interest into the minutest points relating to the archæology of Egyptian life. This course of enquiry was followed by a scientific investigation of the mathematical laws of musical proportion, on which he believed Beauty in all objects to be based. Amid these studies he never neglected the classics, but always kept one Greek or Latin author on his table, reading a few pages daily, and frequently translating into verse the passages which struck him most in his favourite poets. Later on, again, Ethnology and the enquiry into the origins of humanity, claimed his chief attention. He was not content with gaining a general familiarity with modern discovery in these departments; but he collected original authorities and mastered the details of his subject. With the same characteristic thoroughness and mental patience he occupied himself during the intervals of his last illness with the Topography of Greece, taking the greatest possible interest in following the arguments by which it has been attempted to identify the public buildings of Athens. So far, it will be noticed that the special subjects of his study were connected by threads of mutual dependence and illustration. At the same time he never ceased to read much in history, making himself, for example, a complete master of the slightest details of the Parliamentary War, and shewing in his study of Napoleon's and Wellington's campaigns a capacity for understanding military science that won the applause of generals. Among his friends he numbered Sir Thomas Brisbane, Sir Richard Airey, Sir Abraham Roberts, and General MacMurdo. With them, and with all officers who shared his interest in military history, he was never tired of discussing the celebrated campaigns of the past

or in hearing of the conduct of our arms in the Crimea, in India, and in the Peninsula. Amid these varied pursuits the Belles Lettres were not neglected. Whenever he could spare an evening for his children, he used to read aloud some poet or prose writer. Shakspere, Charles Lamb, Tom Hood, Dickens, Southey, Scott, Sir Thomas Browne, De Quincey, Crabbe, Wordsworth, Milton, Shelley, Landor, Keats, Carlyle, Tennyson—all had their turn, with many more, to name whom would be endless; for nothing was more remarkable than the catholicity of his taste and the genuine appreciation he had for every kind of excellence in literature. Among all his favourites one was prominent, to whom, as years advanced, he turned with ever increasing admiration—Milton.

The life of a professional man established in a provincial city, however full of interesting details to his immediate friends, does not offer many points for commemoration in a biography. I shall, therefore, pass over the remainder of the period which elapsed between the settlement of Dr. Symonds in Bristol and his removal to Clifton in 1851, with the general remark that this was a season of unflagging labour, broken only by two flying visits to the Continent. Rising early, as we have seen, to write before breakfast, breakfasting at eight, beginning the day's work at nine, continuing it in various forms till a late dinner, leaving that again to resume the round of visits, and often passing a portion of the night in country journeys—such is the unvarying treadmill at which a physician in large practice has to toil, without the relief of those vacations and occasional interruptions on which all other hard workers depend for relaxation. That physicians should be able in the midst of their employments to keep pace with the advance of science and with current literature is a matter of astonishment. Our wonder is increased when, in addition to extensive reading, we find a man like Dr. Symonds able to devote a portion of his energy to original literary work outside the sphere of his profession. It was at this time that he wrote several of the papers included in the following collection:—the biographical notice of his friend Dr.

Prichard, the address on "Knowledge," the essay on "Apparitions," the monograph on "Mind and Muscle," and the closely reasoned lecture on "Habit." As the titles of these articles indicate, the subjects chosen at this period by Dr. Symonds for public treatment were still closely connected with his medical studies: but the philosophical breadth and artistic elegance with which he handled them, gave to these highly-finished essays the rank of independent literature.

Throughout this period of his life Dr. Symonds continued steadily to win the confidence and respect of his fellow citizens. No scheme of public utility, whether connected with sanitary matters or with education, was discussed without an appeal to his judgment. Applying the same high standard of excellence to public speaking as to literary composition, Dr. Symonds never addressed an audience without striking his hearers by the propriety and harmony of the language in which he conveyed solid thought and careful reasoning. Minute attention to style as the means of accurately expressing and of ornamenting thought was one of his most marked characteristics. It is sometimes questioned whether a writer or an orator may not gain force by the sacrifice of finish: but this sacrifice he never in the slightest of his utterances made; so that in speaking and in writing he was known as the most thoroughly urbane and polished master of classical English. At his table conversation insensibly assumed a tone of greater dignity. In his presence it was difficult to be rude or boisterous or vulgar. Wherever he went, he carried with him an elevating and refining influence without imposing undue constraint upon his company.

In local politics Dr. Symonds took no very active part. He was well known as a steady and consistent Liberal, not shrinking from any of the changes advocated by the leaders of his party. At the same time his interest in politics and the ability with which he handled political questions were so well known as to render many of his professional brethren anxious that he should offer himself as a candidate for the representation of Edinburgh University when it was enfranchised.

1851—1868.

The year 1851 may be taken as an epoch in the life of Dr. Symonds owing to the fact that this was the date of his removal from Bristol to Clifton Hill House, in Clifton, where he continued to reside until his death. This change of residence did not, indeed, involve any very marked alteration in his life and habits; but his house was larger: he was better able from this time forward to indulge his taste for the accumulation of works of art, and for the exercise of a large yet refined hospitality. The drudgery of his profession was in some measure relaxed. He spent the evening more frequently in the society of his friends, gathering around him all the strangers of eminence in literature or science who visited Clifton. It was during the last twenty years of his life that he formed a close friendship with Professor James Forbes, afterwards Principal of St. Andrews, with Professor Conington, and with the present Master of Balliol. The dedications of Professor Forbes's "Travels in Norway," and of Professor Conington's Translation of the Odes of Horace, remain as monuments of the common literary interests which united Dr. Symonds to men of eminence. At Clifton again he made the acquaintance of Lord Macaulay, Mr. Hallam, Lord Lansdowne, and Professor Sedgwick. The society of many others,—among whom I may mention Professor Maurice, Woolner the sculptor, Kingsley, Tennyson, Sir Henry Holland, Sir J. K. Shuttleworth, Baron Bunsen, and Mr. Gladstone,—though only enjoyed at intervals, formed one of the chief pleasures of his life.*

Nothing was more characteristic of Dr. Symonds than his power

* These lists are not meant of course to be exhaustive, but only illustrative of the wide and varied circle of his friends. I cannot forbear from adding here the names of Matthew Davenport Hill, his kinsman and most valued associate during twenty years of intimacy; and of the Dean of Bristol; with both of whom, owing to their residence in the neighbourhood, he was able to enjoy a close and constant intercourse.

of winning the regard and affection of all who came in contact with him by his great ability, by the catholicity of his tastes, and more than all by his kindness. Those who knew him but slightly were drawn to him by the diffusive kindness of his nature: those who knew him better had good cause to say that they had never found that kindness fail: while one of the best and most eminent among his friends described him as "the genius of kindness."

After Dr. Symonds's removal to Clifton he indulged more frequently in summer holidays. Twice he paid a visit to his friends in Scotland, passing a few weeks with Professor Forbes in the beautiful scenery that surrounds Pitlochrie, and renewing his old familiarity with the streets and wynds of Edinburgh. His excursions to the Continent were more frequent. Before the final visit which he paid to Italy in 1869, he made four summer tours with his son and daughter, through various parts of Germany, Switzerland, and Lombardy. The most characteristic point about these pleasure trips was their brevity combined with comprehensiveness. A journal has been kept of one of them in which, starting from Brussels with his son, he visited Cologne, Berlin, Dresden, the Saxon Switzerland, Prague, Vienna, Salzburg, Munich, and the Rhine, within the space of less than three weeks—omitting no matter of importance, but studying picture-galleries and palaces, inspecting battle-fields, riding or driving in search of fine scenery, listening to operas, calling upon foreigners of distinction, examining hospitals, and enquiring into all matters of topographical, geological, and antiquarian interest. In order to secure time for sight-seeing, the travelling was chiefly done by night; nor did Dr. Symonds seem in the least exhausted by the sustained intellectual and physical excitement, which proved sufficiently fatiguing to his son, a lad at college.* On the contrary he showed his freshness by the literature with which he occupied spare moments. Mill's "Political Economy,"

* In a letter dated Lausanne, July 22, 1862, Dr. Symonds writes:—"In this life I realize the laboriousness of my life at home; for what seems to me in travelling no fatigue at all, or even absolute recreation, is to my children hard work,"

if I remember rightly, was the *pièce de resistance* he carried in his travelling bag for study; while the rare half hours of idleness in wayside inns and railway stations were often devoted to the reading aloud of Milton or Tennyson. The habit of constant labour which he had acquired in thirty years of hard professional work, could not be thrown off. The holiday itself became a source of exhaustion: nor was it surprising that the summers in which he stayed at home proved, according to his own confession, less fatiguing than those in which he took a tour.

In 1853 Dr. Symonds was elected a member of the Royal College of Physicians, of which body he became a Fellow four years later. In 1858 he was called upon to deliver the Gulstonian Lectures in the lecture room of the College in Pall Mall. The subject selected by him was "Headache," which, to quote the words of a medical authority, "he treated in an almost exhaustive manner." In 1863 while performing the duties of President of the British Medical Association, which held its annual meeting that year in Bristol, he delivered an address on the "Public Estimate of Medicine." This address is in effect a vindication of Medicine considered as a science and an art,* from the arguments of enemies and incautious admissions of querulous supporters. Admitting the defects and failures to which medicine is peculiarly liable owing to the complex and uncertain nature of the facts with which it has to deal, Dr. Symonds insists with much vigour of conclusive logic that it is unreasonable to attack this art because it cannot boast of mathematical precision.

Continuing the account of medical writings belonging to this period of his life, I may mention a paper on "Death by Chloroform," which was read before the Harveian Society in 1856, and afterwards published in the *Medical Times and Gazette*. The practical value of this essay has been amply acknowledged by the highest medical authorities. Again in 1860 the medical journal above mentioned

* "Long recognized by all enlightened physicians as perhaps the most successful 'Apologia pro vitâ suâ' ever published."—*Lancet*, March 4, 1871, p. 324.

published some strictures by Dr. Symonds on the stimulant treatment recommended by Dr. Todd in his "Lectures on Acute Disease," and in 1864 appeared in the same columns an article of great public interest, on the "Criminal Responsibility of Lunatics." The experience of Dr. Symonds had led him to entertain the opinion that mad people are far more under the dominion of their will, and are more susceptible of being deterred from outbreaks of ungovernable criminal passion than is usually supposed. He was consequently intolerant of the plea of incipient insanity by which criminals frequently elude justice, and believed that it would be to the advantage of the community if mad persons guilty of violence while still at large were held accountable for their actions.

In the midst of professional studies Dr. Symonds continued to cultivate more general literature, and composed at this period the most valuable of the essays included in this volume. "Waste," "Sleep and Dreams," and "Ten Years," were all lectures delivered at the Bristol Institution. They may be pointed out as the best examples of the brilliant and weighty style of their author. The subject of "Sleep and Dreams," which has a peculiar fascination for all readers, was one well suited to display the fine descriptive powers, the calm and solid reasoning, and the large acquaintance with literature possessed by Dr. Symonds. "Waste" and "Ten Years" illustrate another quality of his intellect, his delight in contemplating all that is vast, mysterious, and awful in the world, and in the history of man. The remote past, and the remote future, allured his imagination with a spell that gave its charm to ponderings over the dry catalogues of Egyptian kings, or to speculations concerning the aboriginal races of the European Continent. Again those branches of science which open out illimitable horizons for conjecture, such as the theory of the correlation of forces, or the theories of evolution advocated by Darwin and Huxley, rivetted his attention even while he did not always agree with the conclusions to which they seem to lead. But it was not the practical or logical faculties of his intellect so much as the imaginative and

artistic which were stimulated by these historical and scientific meditations. In this respect I have sometimes thought that his genius closely resembled that of a physician of the seventeenth century, whose eloquent writings he was never tired of studying, Sir Thomas Browne.

A more extensive as well as a more analytical composition belonging to this period is the essay on the "Principles of Beauty." Having been elected President of the Canynge Society for the restoration of St. Mary's, Redcliff, in 1856, Dr. Symonds delivered an address upon this subject, which he afterwards enlarged and published. A considerable portion of the essay is devoted to an exposition of Mr. Hay's theory of the correspondence between the harmonic ratios of sound and the geometrical proportions which, according to his opinion, determine all forms of beauty. Thus a scientific basis is laid for æsthetical speculation. It is in the application of these principles, in their connection with facts of physiology, and in the analysis of intellectual and moral beauty that the author's originality of thought and elevation of sentiment are most conspicuous.

In his studies for the composition of this essay Dr. Symonds gave another proof of his versatility and energy. Up to this time the arts had been to him, indeed, a source of refined amusement; but he had never sought to explain the pleasure he derived from them by reference to any scientific law. He now set himself to observe the nature of sounds in harmony and discord, to interrogate the monochord, to describe ellipses, to construct diagrams, and to calculate numbers—all tasks quite alien to the previous studies of his life, and for the arithmetical portion of which he had an absolute distaste.

After having said so much about the several compositions of Dr. Symonds, and after tracing the various studies to which he successively devoted his attention, it may not be inappropriate to attempt, however roughly, to estimate his literary qualities and to characterize his taste. The most prominent features of his mind

were its firmness, solidity, and soundness. In forming judgments* he was deliberate; in adhering to them tenacious. Fully conscious of the grounds on which he based opinions, he was ready to defend his views by argument. Adding great reasoning faculties to a vigorous memory he displayed unusual skill in collecting facts, marshalling them in their proper order, and drawing their legitimate conclusions. This logical quality of intellect not only strengthened him in the practice of his art, but it also added a peculiar weight and force to his style of composition. It was impossible to treat anything he wrote or said as if it had been written or spoken on the spur of the moment, to meet his arguments with flimsy reasoning, or to disregard his opinions as lightly formed. His language was from the same cause pregnant with meaning, well balanced, carefully chosen, erring if anything upon the side of laborious exactitude and determined fulness, never lapsing into vagueness or the exuberance of inconsiderate fluency. His taste was sound and healthy. He had an instinctive shrinking from everything in art or literature or nature which showed the least tendency to grotesqueness or morbidity. Medieval art possessed no attractions for him. He disliked the style of Dante because of what he thought its repulsiveness and want of form. The polished elegance of Tennyson attracted him: the waywardness of Browning displeased his taste. In fact, his æsthetical standard was classical; not cosmopolitan and eclectic, but strictly restrained by the laws of natural beauty as divined and followed by Greek artists and the best of the Italians. Form he greatly preferred to colour. All objects of art which depend for their attraction upon remote associations, antiquarian interest, or mere magnificence of hue, had but

* It may not here be out of place to mention one of his most marked characteristics, for which our language has no word so expressive as the Greek *ἀυταρκεία*. The friends for whose judgment he entertained the deepest respect, and with whom he most willingly exchanged ideas, can best bear witness to his independence. He never sought advice or declined responsibility; but in the most intricate affairs of life relied entirely on his own conscientious deliberation. This self-sufficing strength of character gave great force and value to his counsel.

little value in his eyes; nor could he tolerate the pursuit of such articles of rarity as old china or old furniture in which there is no intrinsic beauty of design. A similar sympathy for what is harmonious led him to prefer Italian to Swiss scenery; lawns, meadows, and wooded streams to rocks and glaciers; the tranquil and dignified to the sublime and agitated aspects of nature. Owing to this delicacy of taste he disliked emphatic writing and extravagant incidents in works of fiction: he preferred the smoothness of Miss Austen's novel writing to the intensity of Charlotte Brontë; while the sternness of George Eliot's philosophy found less favour with him than the genial worldly wisdom of Trollope. His own experience of what is terrible in human histories made him avoid the artistic presentation of vehement passions and heart-rending tragedies. Culture and refinement were in fact so nicely blended in his nature with profound tenderness that he could not endure to contemplate in fiction what he had too often witnessed in real life. From another point of view the same quality of mind prevented him from admiring many works which though artistically splendid are morally repellent. Though a great reader of biographies he never took the least interest in the memoirs of Cellini or Rousseau, because the revelation of excessive or ill ordered passions grieved him. In like manner, while admitting the greatness of Goethe as a poet and a thinker, he never made a friend of him, and rarely returned after one reading to any of his works. The French novelists, Balzac, George Sand, and Victor Hugo, were for similar reasons excluded from his sympathy. It was long before he conquered his aversion to the grotesque mannerism of Carlyle; and after submitting to the charm of this great master's writing he admired the panegyrist of Cromwell rather than the scene-painter of the French Revolution. This negative account of the peculiar quality of his artistic sense may be best illustrated and supplemented by the mention of Raphael and Milton, as the painter and the poet to whom he gave his earliest adherence, and for whom he retained to the last his profoundest veneration. The healthy beauty of the one, the majesty

of the other, the moral purity and dignity of both, seemed to satisfy all the requirements of his nature.

The qualities of taste which I have attempted thus to characterize are very noticeable in the poetry of Dr. Symonds—a few specimens of which I have included in this collection. Correctness of expression, distinctness of idea, precision of form, elevation of sentiment, harmony and serenity of intellect are traceable in every line. It would be difficult to say that any English poet has been imitated, or that these poems belong to any one school of verse. Yet there is a moral strength and dignity, a philosophical repose, a felicity of grave and studied diction, a parsimony of mere ornament, about them all which remind us perhaps more of Wordsworth than of any other master, proving that their author belonged to the same order of genius as the singer of the "Ode to Duty."

1868—1871.

In the autumn of 1868 the first symptoms of declining health made themselves manifest in an attack of illness, from which Dr. Symonds but partially recovered during the ensuing winter. His strength returned so slowly that, yielding to the persuasions of his friends, he determined in the March of 1869 to take a longer tour than any he had previously indulged in. To visit Rome and Naples had long been one of his most dearly cherished wishes. Accordingly he travelled southward, as quickly as the inconveniences of a very severe Italian spring permitted, with his youngest daughter, and established himself with the intention of spending some time in the Hotel Costanzi at Rome. But the climate proved unfavourable to his health; and Rome itself was too full of mental stimulus for one who needed rest. Pictures, sculpture, antiquities, ruins,—all the accumulated interests and associations of the capital of the world—claimed his attention and aroused his old activity. He fell ill and dreaded an attack of Roman fever, to avoid which he removed to Castellammare, near Naples, and thence again with the advance of

spring moved northwards to Florence. There his weakness returned with greater force, and he was obliged to quit Florence for Venice. After this he travelled slowly homewards through Tyrol and Germany, somewhat, although but superficially, restored in health. It is melancholy to think of this journey, anticipated through years of toil with feelings of the most vivid expectation, but rendered worse than useless for all purposes of pleasure by the illness and debility which constantly reminded the traveller of the change which had come over him. At this time, however, prolonged repose and careful attention to health might still have arrested the undefined and insidious approach of fatal sickness. But to absolute retirement from practice Dr. Symonds would not consent, though urged to take this step by the members of his family and by his most intimate friends. He fancied that his strength was sufficiently re-established to admit of his engaging in at least a moderate amount of work. Nor did the experience of the summer fail to justify this opinion. Unfortunately, however, for his progress towards recovery the annual autumnal congress of the Social Science Association was to be held in 1869 at Clifton, and Dr. Symonds was appointed President of the Health Section. During the summer months he threw himself with his accustomed energy into the preparation of his address on "Health," and of a paper which he read on the repression of habitual drunkenness. The labour of composition was followed by the strain of presiding over his Section during the Congress; added to professional duties this unusual pressure of work proved too heavy for his strength. Before Christmas he left Clifton for Brighton in the hope that change of air might restore some portion of his vigour. When he returned, he finally abandoned practice. Although his health was now most seriously broken, he had at least immunity from pain, and enjoyed the exercise of all his mental faculties. Books became more than ever his pleasure; it seemed even possible that he might still have many years of moderate enjoyment in store for him. If before his illness his life had been a pattern of strenuous activity, it now became no less remarkable for patient endurance

and for cheerfulness under privation. Struck down at the early age of sixty-two, suddenly arrested in the midst of a career of usefulness, smitten by a slow disease, the nature of which he fully understood and which he vainly strove to combat, forced to exchange authority for obedience, and energy for inaction,—he never murmured but supported himself with a philosophy of tranquil and unquestioning acceptance. During the summer of 1870 he was visited by an attack of acute illness, and for two or three weeks it was thought impossible that he should live. From this he rallied: the autumn and the early winter months were passed by him in study. He even composed and dictated at this time a review of Wallace's criticisms on the Darwinian theory of Development. The books he read were principally biographies, and works on Greek topography; but he did not neglect even deeper subjects. Volumes of Herbert Spencer's and Mill's Essays, or of Lewis's "History of Philosophy" might often have been seen upon his desk, or, as the weeks went on, upon the bed to which he was now frequently confined. With the beginning of the new year a decided change took place. He grew weaker and weaker, till at last he died on the 25th of February. Till within a few hours of his death he retained his mental faculties intact. He astonished the physicians who visited him by the clearness and coherence of his views of his own case. Each member of his family received from his lips some touching proof that he carried with him to the grave the same affection and vivid interest which he had shewn to them through life. To the last he continued to converse with pleasure upon all topics, showing a mind at rest—perfectly content to quit this world, serene in the certainty that it must be well with those who have striven to conform themselves to the Divine Will. I am unwilling to do more than touch upon a subject so sacred as the faith by which the soul of this good and great man was supported throughout life and sustained in the hour of death. It was a faith that cannot be described by any formula or reduced to the shibboleth of any sect, a faith so strong and vital and instinctive, so deeply

seated in the mental and moral nature, so far above the petty strifes and temporary phases of conflicting dogmas, so carefully reasoned, so reverently preserved, that it seemed to be the very source of life to him who held it.*

In passing from this brief and meagre record of the facts of my father's life to the attempt to estimate his personal character, I shrink from a task which it is impossible for a son, especially in the first sorrow of bereavement, to fulfil. What, however, I could not do myself has been done for me by one who knew and loved him truly. The following letter addressed to me by my brother-in-law, Sir Edward Strachey, leaves nothing in this respect to be added or desired :—

"You ask me to give you something of my estimate of your father's character. I will do what I can; but I feel that my relationship with him by marriage, and our long and intimate friendship, before as well as since my marriage, in some respects disqualify me from giving such an estimate, though they have perhaps afforded me better opportunity than most others of knowing what that character was. For I cannot be expected—I cannot even desire—to be an impartial judge in this matter. I am conscious that my language must be that of eulogy, even while I believe that it is most sincere. I do not indeed think I shall pass the limits of the strictest impartiality if I say that if I sum up your father's character in one word, that word is *magnanimity*. He was great in intellect and in intellectual tastes and habits; he was great in the force, the dignity, and the purity of his life; and he was great—if I say greatest, it is not to diminish the weight of my former words—in his affections, in the deep and strong, yet tender and overflowing love which he felt and shewed first to his own children and family, but beyond them, in an ever-widening circle of kindness, humanity and philanthropy towards all with whom he came in contact in life, or contemplated from a distance. And this strong human affection was united with a piety towards God, a sense of the goodness of God, and a personal thankfulness to God for his own share of that

* The following extract from a letter, written by Dr. Symonds to a friend in 1851, very distinctly expresses what were his opinions about the relation of the religious to the active life :—"God is the centre of the moral as of the physical world. It has pleased Him to place our souls, like the starry spheres, in orbits that are governed by centripetal and centrifugal forces : the former draw us towards Him; the latter propel us through those scenes of outward life where our work and our duty lies. Moved too centripetally, we become ascetic or fanatical. Carried away too centrifugally, it is well if we do not fly off at a tangent into chaos, or to the devil, the Lord of that domain of lost intelligences."

goodness, the expression of which, because it was so living, ever came upon me with the force of novelty, though a not uncommon subject of discourse between us. It was a piety which bore in its spontaneous and habitual utterance the best evidence of its life and freshness; and I hardly needed our frequent and unreserved discussion of these matters on the ground and by the tests of truth and reason to enable me to know how living and fresh it was, and how far from being the mere continuation of the habitual beliefs which a man of blameless life will often retain from the religious education of his childhood without much sense of their practical reality.

"Your father possessed what Coleridge defined as 'commanding genius,' the genius of action as distinguished from that of philosophic contemplation and origination. Those who are best able to pronounce a judgment on his professional character—his brother physicians—will, I believe, agree that he had reached the highest knowledge and skill as a physician; that none had attained to more of the science and the art of medicine; and that if he had not preferred Clifton to London no name would have been more eminent than his in the profession. But while the practice—practice resting on the scientific study—of medicine was the real work of his life, to which all other things were habitually subordinated, there was no subject of human interest, however remote it might seem from his daily work, of which his active mind did not take thoughtful notice. Art, poetry, history, science, philosophy, and politics, in their oldest and their newest forms, recorded on Egyptian monuments, or in the last publications of the day,—'nil humani a se alienum putavit;' and those who habitually enjoyed, as you and I and so many more did, his brilliant yet thoughtful conversation in his most hospitable home, will add, 'nihil quod tetigit non ornavit.' And he was even more remarkable for his moral force than for his intellectual activity, though the two were so well tempered together that I have often thought that he might have been a great statesman if he had made politics the business of his life. 'Never hasting, never resting,' he seemed to us in past years to possess that physical frame 'incapable of fatigue'—which too has been said to be indispensable to a statesman; but now that we know too late how he suffered from serious disease, originating doubtless in over-work, yet for a long time not arresting that work, we know that his apparent physical energy must have been sustained by a still greater moral energy—a will as well-regulated as it was strong, directing his whole powers along that course of action which duty prescribed. A deep and strong sense of duty sometimes gives a man, especially if of firm will, a sternness of character; but this was not so with your father; his strength was that of a man, but his tenderness was that of a woman. I do not speak of what he was to us and in all his family relationships: of these things we must say with Tennyson, 'Open converse there is none,'—the children by the hearth can only think in silence, 'How good! how kind! and he is gone.' But recollections crowd upon me of his sympathy with the sufferings, the anxieties, or the hopes of those with whom his profession brought him

in contact, or whom he heard or read of in the outer world. Those who knew him best knew best how genuine that sympathy was, and that it was no mere softness of manner which might be expected in any master of the physician's art. I will mention two instances—which his friends could multiply an hundred fold, of his sympathetic goodness. He had been attending a sick clergyman who had come to Clifton with his family to be under his care, and had taken the usual fees for some months. He knew nothing of the circumstances of the family, which appeared to be good; but just before they left something occurred which suggested to him a suspicion that such was not the case. On this mere hint, with a generosity which none of us can think unusual in him, he sent a cheque for the whole amount of those fees to the wife of the clergyman, and was repaid by her telling him that his gift was of the utmost value to them, for that notwithstanding all appearances, it had been only by the greatest sacrifices that they had been able to spend those months at Clifton for the sake of his advice. On another occasion, a small farmer in my neighbourhood (who told me the story a short time since, though it occurred ten or eleven years ago), went by the advice of the country doctor to beg your father to visit his wife who was in danger beyond the reach of country skill. It was at night, and in the worst wintry weather, and when your father came in at the end of a hard day's work he found the farmer waiting with the application. The distance was several miles; and your father told the farmer that he himself was so unwell that he was not able to undertake the journey that night. He urged that the woman was very ill: your father asked whether she was related to him; and when he replied that she was his wife and the mother of ten children, your father, ill and tired as he plainly was, said, 'I'll come;' and to his visit that night the farmer doubts not that he owes it that his wife still lives. His sympathy with the actual sufferings of his patients and their friends was such that he has told me that he sometimes felt as if he could hardly continue his practice; yet, on the other hand, when in the prospect of his failing health I have talked with him of the desirableness of his retiring from work, he always recurred to the doubt whether he could rightly—for such questions ever became with him, as by unconscious instinct, questions of right—withdraw from the use of that power of alleviating human suffering which he had acquired in long years of experience. In that well-balanced mind I cannot contemplate the spirit of duty which pervaded every action without recognizing the not less everywhere present and powerful spirit of sympathy, responsive to every form of life and happiness, and still more to every form of suffering and sorrow.

"His whole life was 'nothing but good and fair' in all the meaning which the old Greeks he loved so well gave to those words, and the still deeper meaning with which his not less-loved Milton repeats them.—'Home he's gone and taken his wages;' if he sleeps, it is a sleep from which, as he wrote on your mother's and now his tomb, there is a waking."*

* εὗδε φίλη ψυχὴ γλυκερὸν καὶ ἐγέρσιμον ὕπνον

Some words must be added respecting Dr. Symonds' purely professional qualities. Here I can do no more than attempt to record the opinion expressed by the best judges among his brethren. They are unanimously agreed in speaking most highly of the sagacity and logical acumen with which he brought his wide experience and accurate scientific knowledge to bear upon the cases that fell beneath his observation. Dr. Symonds was equally strong in the analysis of disease and in the anticipation of its probable progress, duration, and ultimate determination. Gifted with a singular faculty for reading the physiognomy of sickness, he was led by an unerring tact to divine which organs were in fault, to estimate in complicated cases the bearing of several disorders on each other, and to calculate the endurance which the constitution might be expected to display. In his employment of remedies he was especially skilful. The sagacity which led him to detect the lurking sources of disease and the sustained reasoning by which he was enabled to calculate its future course, did not desert him in the department of therapeutics. *That* he looked upon as the peculiar province of the practical physician as distinguished from the pathologist. The whole humanity of his nature came to the aid of his science and his reason when he found himself face to face with his enemy in the shape of disease that could be conquered, or when, the resources of art to restore health proving unavailing, he had nothing left but to alleviate suffering and prolong life. In combining drugs of different qualities, so as to render them reciprocally powerful; in suiting his remedies to the peculiar temperament of each patient; in uniting several methods of treatment and making them co-operate to the one object of a cure, he showed remarkable dexterity. Though resolute in pursuing a plan adopted with deliberation, and not easily daunted by apparent obstacles or temporary ill-success, he was always ready with fresh expedients; indeed, there seemed no end to his inventiveness. He was never wedded to one theory, never preoccupied by pet opinions, nor biassed, as is often the case with men whose reason forms a less sure

counterpoise to their imagination, by the results of peculiar experience and observation. Accurately to examine, dispassionately to judge, and then, guided by vigorous reasoning, to exhaust all the resources of his art in the sole interest of his patient was the simple rule of his professional conduct. With regard to his dealings with his brethren there is but one opinion—that he combined consummate courtesy, perfect justice, and scrupulous honour, with a weight of personal influence, and a scientific ability that rendered his assistance in consultation invaluable.

In confirmation and support of this brief estimate, I shall here insert a quotation from the obituary notice published in the *British Medical Journal* (March 11, 1871), from information communicated by two of the most distinguished physicians of Clifton :—

"In looking back upon his career it is impossible not to record certain eminent characteristics. He had a great love and honour for his profession. He was always most anxious that the science of medicine should take its proper place in the minds both of scientific men and of the general public. As a practitioner he was cautious in diagnosis, but often vigorous in treatment. As a consulting physician, he had no rival in the West of England, combining qualities which commended him in the highest degree to the profession and to the public. While availing himself to the fullest extent of the observations of the medical attendant, he was careful himself to test every point that was capable of verification; and while he suffered no consideration to interfere with the course most likely to benefit the patient, he always yielded due honour to his professional brethren, and due weight to their opinions. His liberality to his juniors in the profession was carried to a very unusual degree, and his hand was ever held out to help others to rise. His acumen in diagnosis, especially in diseases of the heart and lungs, was very remarkable; and his memory of former cases was so good that in the most difficult circumstances he could always afford practical suggestions of the utmost value. His brilliant powers of reasoning, his untiring energy, his regular habits, his marvellous sympathy with suffering, and his general trustworthiness were all elements in attaining a success, which it is not too much to say, has been unrivalled by any provincial physician in this generation.

"On the whole, there was a rare completeness and rotundity about Dr. Symonds's character and career. Though he died at the comparatively early age of sixty-three, he had long before attained all the honours that are open to a physician in a great provincial city. In all matters not purely political or municipal, he was looked up to and referred to by his fellow-citizens as their natural leader and adviser, and thus held a position among them too seldom

occupied by men of his profession, and which he owed to a singular combination of endowments,—high literary and scientific as well as professional attainments, cultivation and elegance in speaking and in writing, intuitive tact and knowledge of men, ready hospitality and unostentatious generosity. His power of self-control, his thorough mastery over his whole moral and intellectual nature was one of his most remarkable characteristics; and his warm and generous feelings, directed and controlled by a sound judgment, diffused a steady glow of beneficence around him."

Enough perhaps has now been said to give some faint idea of the character and genius of a man whom those who loved him felt to be as good and great as man on earth may be. Yet I cannot bring my task to a close without transcribing for the readers of the following pages a passage in which he has himself expressed his own ideal of a perfect character, leaving those who knew him to answer whether through the whole course of his blameless life he did not realize in every act and thought and word that beauty to which he here so powerfully and reverently alludes :—

"I dare not venture on more sacred ground; but he who has had the happiness of watching the lives of those who, in passing through the world, escape contamination; who devote their faculties, endowments, and exertions to the promotion of the happiness of others, by making them wiser and better; and who shew in all their actions and feelings and endurances that the moral sentiments are developed to the greatest height commensurate with humanity —because they are interpenetrated with, and become assimilated to, the divine light and the divine pattern;—he who has watched the course of such lives and characters will understand what is signified by 'the beauty of holiness.'"

THE

PRINCIPLES OF BEAUTY.

I.

THE word Beauty has two meanings, being used in a manner analogous to that in which the word Heat is employed. For as the latter is applied both to the feeling of heat, and also to the property in outward bodies which causes the feeling, so Beauty expresses both the feeling in the mind and its external cause. But the analogy will not bear to be extended further. Heat, for instance, so far as its operation on matter is concerned, may be considered quite apart from any impression on a percipient mind, and can be conceived to consist independently of mind: but the conception of Beauty always involves a mental impression or action. Exclude feeling and thought, and no place will be found for Beauty.

It will be at once a convenient and a natural arrangement of the subject to consider Beauty in relation, first, to Sensation; secondly, to Thought or Reflection; thirdly, to Moral Sentiments; and fourthly, to Associated Emotions. After these topics, we shall conclude with a few remarks on the Uses of Beauty.

II.

Though we speak of Beauty as having sensation for one of its causes, it must be borne in mind that it is only such sensation as comes through the eye and the ear. The senses of sight and hearing have been called the art-senses, and are distinguished from the others by

their greater objectivity. Of their results our own personality forms a smaller part. Taste and smell and touch we cannot describe but in terms which involve our own bodily consciousness as part of the sensation. *We feel* the taste, the smell, the touch; but the hill, the tree, the bird, the thunder, the wind, and the song, are spoken of as separate from our own personality, and without reference to our organs or nerves of seeing and hearing. We may in subsequent observations and reflections ascertain or infer that these objects were made known to us by the instrumentality of our eyes and ears; but neither these organs, nor any part of our corporeal personality, were brought before our minds in the first perceptions of such sights and sounds.

Our English word *feeling* seems to belong especially to those states of consciousness of which the Ego or personal consciousness is the principal part; for examples, the emotions, the moral sentiments, the internal bodily sensations (hunger, thirst, &c.), and the outward sensations caused by the contact of external bodies with the skin and by the action of the muscles, in tact and touch. And though we do not use exactly such a phrase as *feeling a flavour, or an odour*, yet we must admit that there is more affinity between these two sensations and bodily feelings, than between the latter and the sensations of sight and hearing. Into the sentiment of Beauty through sense objectivity necessarily enters. The pleasure ensuing on sight and sound has a characteristic difference, which we express by the word beautiful; but pleasant odours and flavours are described as delicious—a word which involves a degree of subjectivity or personal delight approaching to the sensual. Of all the sources of pleasure, perhaps the most frequent is that of sight. Sight more frequently, extensively, and importantly than any other sense, put us in relation with the outer world; and the quality by which we designate the pleasure which accompanies this sense is applied by metaphor to almost everything which gives us either agreeable feeling, or mental enjoyment.

There is no better definition of what is beautiful, in its simplest essence, than the phrase which we meet with early in the Bible—"pleasant to the eye." Visual pleasure is the germinal form of Beauty. "Truly the light is sweet, and it is a pleasant thing for the eyes to behold the sun." But the word receives far more extensive and more complex applications. By the transitions of language it often expresses that of which visual pleasure is no component, or a very small one. An infant's delight in a brilliant object, or some vivid

colour, illustrates the simplest form of beauty. The mother, looking fondly at the infant's smiling face, and hearing its crow of joy, has a more composite feeling of the Beautiful. A philosopher, watching the two, exclaims, "What beautiful illustrations of my theory!" using the epithet partly in its metaphorical sense, but also in expression of a kind of beauty,—namely, that of fitness, which may be considered hereafter.

Why certain feelings give us pleasure, it is often difficult to explain. But there are some general facts, which belong, more or less, to all pleasurable feelings. Thus pleasure will result from the mere *novelty* of the sensation — and with an obvious final cause independent of the enjoyment, since it calls our attention to the outer world, and makes the business of learning outward things an agreeable excitement instead of a toil; but if there is nothing in the impression but its novelty to afford us pleasure, the enjoyment soon ceases. Nature, however, is so rich, and art so fertile, that this source of pleasure never fails, and it meets us under the form of what we call *variety*. It is this which gives liveliness, piquancy, and animation to our every-day life. How much we prize it, is evident from many of the terms of commendation which we apply to things which are fresh and new and unworn—"To-morrow to fresh woods and pastures new!" But it will not alone suffice to impart pleasure. It will not make an agreeable sensation out of one that is in its nature disagreeable. But if the sensation be of a neutral character, the novelty will bestow on it a kind of charm, which betrays the feelings into a sense of the beautiful; and often erroneously, as we see in new fashions of dress. Impressions, pleasant in themselves, pall by too frequent repetition, or too long a continuance, and at last fail to awake the consciousness, unless united with some collateral interest.

But *change* must not be abrupt or sudden; or, if it be so, the impression must dwell long enough for the first effect of suddenness to subside. Quick exchanges of light and shade, of sound and silence, by no means afford that sort of pleasure which would be called beautiful. They are rather alternations of surprise and disappointment. A vivid impression ought to cease gradually, or to pass by degrees into that which is to succeed. This is the agreeableness of continuity.

Besides variety and continuity, there is another circumstance under which sensation gives pleasure, viz. *similarity*. Repetition is agreeable,

not only if the thing is pleasant in itself, and before the repetition palls, but also through the recognition of the feeling, as being like what had been felt before. That enjoyment should accrue from the perception of similarities is scarcely less important than the gratification of variety, because we thus learn to classify the objects of our knowledge. But mere likeness without difference becomes distasteful sameness or dull uniformity,—just as mere variety without likeness would be intolerable; for in this case there would a number of insulated experiences without any connection; and the perception of relations is one of the deepest wants of our nature.

The pleasure derived from similarity enters largely into the beauty of symmetry. This side is like that. This curve corresponds to that. And it is like with a difference; the difference being in place or material *(idem in alio)*. It is similarity which constitutes the pleasure derived from imitation, and not merely the pleasure of witnessing the successful production of likeness; for, even if the imitation is accidental, the spectator is pleased, as in the fortuitous resemblances occasionally seen in nature—as of stones which have some resemblances to plants, or of plants which in a manner resemble animals. This kind of pleasure is derived from those lowest works of art which are mere copies of natural or artificial objects. Similarity enlivened by difference, variety restrained by unity, may be found in all the arrangements of light and shade, form, and colour, and sound, which are most pleasing to the eye and to the ear; and the same principles may be traced in those movements of the body which are attended with pleasure.

Most of our sensations are received in conjunction with muscular action. This exercise must be easy, or the enjoyment will be spoilt. In muscular exercise there is constant alternation of action and repose. To be pleasant, the movements should occasion no feeling of effort or fatigue. The pleasure which ensues on the action is not referred to the moving parts,—but there is an agreeable condition of the personal consciousness. To render it pleasant there must be sufficient rest to prevent fatigue; and this is effected by change in the direction of the movements, so that different muscles may be employed, or the same muscles in different degrees. The pleasure is enhanced when the alternations of action and repose occur at regular intervals. Thus it is easier to march or dance to music. We have said that the *sudden* change of a sensation is disagreeable. The same may be said of a muscular movement. A sudden resistance, and a sudden removal of a

resistance, are almost equally displeasing. *Continuity*, then, is an element in agreeable movements, as well as in pleasant sensations.

The influence of similarity, and variety, and continuity may be traced in the beauty which belongs to simple lines—and quite apart from all collateral suggestions. A straight line can hardly be said to be in itself either beautiful or the reverse. It has unity of direction, which, if too prolonged, may be displeasing by excess of uniformity, and by muscular fatigue. Two parallel lines are agreeable or satisfactory by reason of their similarity of direction, and their equality of distance throughout their length. Two lines converging partly enclose a space which may give pleasure to the eye, when seen in relation to some other angle, by virtue of the proportion. The angles are seen comparatively in a triangle. In the equilateral triangle the angles give the satisfaction of similarity, unity, and equality of ratio to the whole,—being 60° : 60° : 60° = 180, or 1 : 3.

In the right-angled isosceles, they present unity and variety, and yet definite proportions,—being 1 : 1 and 1 to 2, i. e. 45° : 45° and 45° : 90°.

In the scalene triangle made by bisection of the equilateral we have variety governed by proportion,—the angles being 30° : 60° : 90° or 1 : 2 and 2 : 3.

In another scalene, we have 18° : 72° : 90°, or 1 : 4 and 4 : 5.

We have said that into agreeable sensation variety, continuity, and similarity enter more or less. Now a curved line presents both continuity and variety, in a manner agreeable to the sensation of sight, and calling forth an agreeable exercise of the muscles of the eye. But some curves are more pleasant than others. The circle is less agreeable than the ellipse, and the simple ellipse than the ovoid or composite ellipse. In the circle there is constant change of direction; but every change is like its predecessor, and the general appearance is excess of uniformity or monotony. Moreover, the muscular actions which trace it, whether of the eye or of the hand, are comparatively difficult. In the ellipse the change of direction is more gradual, and the figure admits of division by the eye, without diameters, into opposites which are similar and symmetrical. The ovoid is still more beautiful from the yet greater variety of direction, with perfect facility of gradation.

But it is in combinations of lines that the principles which have just been adverted to become still more obvious. If we trace a succession of straight lines of equal lengths, forming a succession of

equal angles (as in the pattern for ladies' work called Vandyke), the effect is not unpleasing; for there is a variety of direction, recurring at equal intervals, that produces similarity, and thus compensates in some degree for the want of continuity and gradation: but if the successive lines are of unequal lengths, and at unequal angles, making what is called a jagged line, we have a very disagreeable effect—the result of sudden transitions of direction, without any regularity of intervals. It is the excess of variety. But, in estimating the æsthetical effect of combinations of lines, we are apt to forget (and I am not aware that this subject has been hitherto noticed) the influence on the eye of the partially enclosed spaces. In following such linear forms, the eye not only pursues the lines, but it also traverses the intervening spaces. I have adduced the monotony of the circle, and the more pleasing variety of the ellipse, as explained by the direction of the curve. But, apart from the course of the line, there is an impression left on the sense by the enclosed space. The circle is always the same in form, however different in size, the radii being equal. The ellipse, on the other hand, is in its nature variable, and is at once recognised as such. It suggests a form which may vary almost indefinitely by the varying proportions between its major and minor axis.

When lines are so combined as to produce only partial enclosures of space, the influence of the latter will depend on the arrangement of the lines. Thus if we take a series of semicircles of equal diameters, and arrange them on a horizontal line with the convexities uppermost, the effect is agreeable. For, though there is a repetition of the same linear form, the spaces between the semicircles are bounded by curvilinear angles, which produce a pleasing contrast. But if the semicircles are so arranged that the curves flow into each other, and so take opposite directions—that is, with alternating convexities and concavities—the eye is chiefly occupied with the line, the effect of which is thus equally balanced between the variety of direction and the similarity and equality of the curves. Though the effect, however, is agreeable, the pleasure does not equal that which is produced by the undulating or waving line, which is made up of a succession of segments of ellipses.

So much, then, for lines.—But there are forms of a composite character which excite the feeling of Beauty by reason of a profounder symmetry than is at first sight discoverable,—a symmetry the nature

of which may afford to the æsthetical student a subject of very interesting speculation.

This higher kind of Beauty of Form may be perceived and delighted in without any knowledge of its source; but there must be a certain organization of the sensorium for this effect. As it is a well-known fact that some persons are insusceptible to the enjoyment of the more complex forms of harmony of sound, so there are subtleties of symmetry beyond the range of ordinary perception. There are individuals who have not the æsthetical constitution which would enable them to recognize and enjoy the exquisite proportions of the Venus of Melos, or of the portico of the Parthenon, just as others are dead to the harmonies of Beethoven.

I think I may appeal with confidence to the experience of all who have felt great delight in architecture and sculpture as to the fact of there being an intuitive perception of harmony, or a feeling of satisfaction and admiration, arising in the mind, on the contemplation of a building in its totality, very different from the enjoyment of the beauty of separate parts. A great deal of the pleasure, and indeed the most common gratification, is that which is derived from parts. We see a cathedral, and talk of the beauty of such a window, or such an arch, or transept, or cluster of pillars. Our admiration of the building, as a whole, is very different. Long before I had the least idea of the cause of my enjoyment, I remember the peculiar delight with which I looked at Salisbury Cathedral as a whole. It was not to my consciousness resolvable into an aggregate or succession of pleasant impressions from spire, tower, arches, buttresses, and windows; but it was an indefinable sense of harmony of proportion. Common as such feelings must have been, it is remarkable that till of late they have not been satisfactorily accounted for. One source of the pleasure has been discovered and elucidated by the genius and the patient investigations of Mr. Hay. The following observation had been thrown out by Sir I. Newton in a letter to Mr. Harrington:— "I am inclined to believe some general laws of the Creator prevailed with respect to the agreeable or unpleasing affections of all our senses; at least the supposition does not derogate from the wisdom or power of God, and seems highly consonant to the simplicity of the microcosm in general." This was in answer to a suggestion of Mr. Harrington's, that the proportions in architecture are coincident with the harmonic ratios in sound. But his attempts to realize the idea

were founded on lineal measurements, and they were unsuccessful. Mr. Hay, having found that the harmony of forms could not be explained by ratios, derived from lineal measurements, was led to inquire whether the clue might not be found in the proportions of the component angles. The result, after many years of acute observation and unwearied study, has been, that a form is beautiful when the space which it encloses can be analyzed into angles which bear proportions to each other analogous to those which subsist between the notes of music. The basis of harmony is, that, when sounds mingle agreeably, the vibrations of which they are severally composed bear such a relation to each other as is capable of a very simple numerical expression. Thus, the octave is 2 to 1; the dominant 2 to 3; the mediant 4 to 5. All the *harmonics* are composed of whole numbers in relation to the unit—as $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, &c. These harmonics again correspond to the points or *nodes* at which a string in vibration spontaneously divides itself.

Indeed, all the numbers in which musical notes are expressed denote relations of physical agencies. Thus, the octave, or eighth note of the musical scale, is the double of the first in this respect,—viz. that in a second of time the octave has double the number of vibrations which belong to the fundamental note. The notes composing the diatonic scale lie between the fundamental note and its octave; and the fractions belonging to them denote the relative lengths of the string, and, inversely, the proportionate number of vibrations. Thus, the octave is the sound of half the string, and the vibrations are as 2 : 1. Take *C* of the middle scale. The second note *D* is to *C* as 8 : 9, being the sound of $\frac{8}{9}$ of the string. While *C* is vibrating 8 times *D* vibrates 9. The vibrations of the third note *E* bear to those of *C* the ratio of 5 to 4; the length of the string being $\frac{4}{5}$. The fourth note *F* is sounded by $\frac{3}{4}$ of the string, and the vibrations relatively to *C* are as 4 to 3. *G* is the fifth note, and belongs to $\frac{2}{3}$ of the string; and the ratio of its vibrations, in relation to the fundamental note, are as 3 to 2. The sixth note *A* has $\frac{3}{5}$ of the length, and therefore its vibrations are as 5 to 3. The seventh note *B* has $\frac{8}{15}$, with a corresponding ratio of vibration. The eighth is the octave *C* and completes the diatonic scale. Mr. Hay has found it convenient for his analogy to adopt the old German scale, and take in *B* flat, which is $\frac{4}{7}$, and called *B natural* in the old scale, while our *B* natural was formerly designated *H*.

If we follow up the notes into the higher octaves, successively, we shall find that all the numbers are multiples of 2, 3, 5, and 7. There are no other primes than these. Here is a scale of four octaves :—

	Tonics.	Super-tonics.	Mediants.	Subdomi-nants.	Dominants.	Subme-diants.	Subtonics.	Semi-sub-tonics.	Tonics.
I.	(1)	$(\frac{8}{9})$	$(\frac{4}{5})$	$(\frac{3}{4})$	$(\frac{2}{3})$	$(\frac{3}{5})$	$(\frac{4}{7})$	$(\frac{8}{15})$	$(\frac{1}{2})$*
	C	D	E	F	G	A	B	H	*c*
II.	$(\frac{1}{2})$*	$(\frac{4}{9})$	$(\frac{2}{5})$	$(\frac{3}{8})$	$(\frac{1}{3})$*	$(\frac{3}{10})$	$(\frac{2}{7})$	$(\frac{4}{15})$	$(\frac{1}{4})$*
	c	*d*	*e*	*f*	*g*	*a*	*b*	*h*	*c*
III.	$(\frac{1}{4})$*	$(\frac{2}{9})$	$(\frac{1}{5})$*	$(\frac{3}{16})$	$(\frac{1}{6})$*	$(\frac{3}{20})$	$(\frac{1}{7})$*	$(\frac{2}{15})$	$(\frac{1}{8})$*
	c	*d*	*e*	*f*	*g*	*a*	*b*	*h*	*c*
IV.	$(\frac{1}{8})$*	$(\frac{1}{9})$*	$(\frac{1}{10})$*	$(\frac{3}{32})$	$(\frac{1}{12})$*	$(\frac{3}{40})$	$(\frac{1}{14})$*	$(\frac{1}{15})$*	$(\frac{1}{16})$*
	c	*d*	*e*	*f*	*g*	*a*	*b*	*h*	*c*

It is curious to observe, in passing, how the prime numbers correspond to the relations of unity and variety. *Two* is 1 + 1, and therefore the type of unity and equality. *Three* is 2 + 1 ; the first uneven number, and the type of variety. *Five* is the combination of the two types—and *seven* also. We have remarked that harmonious notes vibrate relatively to each other in ratios of very simple numerical expression, and we have instanced those of the octave, dominant, and mediant, in relation to the fundamental note. In comparing the intermediate notes with these, and with each other, the same law regulates the degree of consonance and dissonance. The higher the numbers, the less is the harmony. Thus *C* is to *D* as 8 : 9, and the sound is disagreeable ; and *D* sounded together with *E* is still more displeasing, the ratio being 9 : 10 ; but *D* with *G* is quite harmonious, being 3 : 4, and so on. The following table exhibits some of these combinations. Let any one sound these notes together on the piano or the harmonium, and his ear will at once appreciate the truth of the statement, that harmony of sound and simplicity of numerical ratio go together :—

C : *c*	1 : 2
C : G	2 : 3
C : F, E : A, D : G	3 : 4
D : B nat.	3 : 5
C : E, F : A	4 : 5
E : G	5 : 6
G : B flat	6 : 7
C : B flat	7 : 8
C : D, A : B	8 : 9
E : D	9 : 10
B : B flat	14 : 15
B nat. : *c*	15 : 16

It has been the attempt of many investigators to discover harmonic ratios in the measurements of beautiful forms, both in nature and in art; but the results proved unsatisfactory when the measurements were all linear, or comparisons of heights, and lengths, and breadths. Mr. Hay was the first to conceive the idea of measuring and testing the proportions of component angles in such forms. The working out of his idea, in a very large number of instances, has been attended with the most gratifying success. With some of these results I shall endeavour to make my readers acquainted. Those who wish to pursue the inquiry further will, of course, study the works of Mr. Hay.

It will be necessary, however, to premise a few words respecting the geometrical figures into which beautiful forms may be resolved. The chief of these are—the triangle, the rectangle, the circle, the ellipse, and the composite ellipse. The varieties of these may be designated by some one angle, which is therefore the governing angle. The equilateral triangle has its angles equal, each being 60°. But, if the triangle be bisected, it gives two right-angled scalene triangles equal to each other. A scalene triangle thus formed contains the angles 30°, 60°, 90°. It is called the triangle of $\frac{1}{3}$—the smaller angle being one-third of a right angle. And any scalene right-angled triangle is designated by the proportion which the smaller angle bears to the right angle. Thus, should the smaller angle be 22° 30′, the triangle would be called the triangle of $\frac{1}{4}$; of 18°, $\frac{1}{5}$; and so on. The isosceles right-angled triangle is half of a square made by the diagonal. The two smaller angles are equal, each being 45°, and therefore bearing to 90° the ratio of 1 : 2. This triangle is then a triangle of $\frac{1}{2}$.

Rectangles are designated by the angles formed by their diagonals. The square is a rectangle of $\frac{1}{2}$; other rectangles may be rectangles of $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, &c., according to the ratios of the smaller angles of their component triangles to the right angle. (See Plate I.)

A circle may be inscribed within a square or a square within a circle. The circle is therefore a curvilinear form of $\frac{1}{2}$, being governed by the angle of 45°, which is a tonic angle. The ellipse is of very variable dimensions—measurable by the triangle formed by the semi-axes, and a line joining their extremities. If this triangle be governed by an angle of 30°, the ellipse is an ellipse of $\frac{1}{3}$, or a dominant ellipse. Parallelograms and ellipses are correlative like the square and the circle. (See Plate II.)

These proportions have been derived, as it will be remembered, from the right angle. According to Mr. Hay's system of harmonic proportion any angle may be taken as the fundamental angle: but the other angles must bear proportions expressible in numbers corresponding to those which belong to the ratios in music; and angles, parallelograms, and curves, are spoken of as dominants, mediants, tonics, supertonics, &c., as indicating those ratios to the fundamental angle. They bear also harmonious or discordant ratios to each other, analogous to those which have been already pointed out in the several notes of the diatonic scale.

We are now prepared for the illustration of these principles by the results of an analysis of certain acknowledged forms of beauty.

The symmetrical beauty of the human face and head is mainly dependent on the bony structures. The beauty of expression, or the beauty belonging to variety, results from the action of the muscles in the play of the features;—but with the former are we now chiefly occupied. The configuration of the cranium approaches more or less to that of a globe; and the configuration of the face to that of a prolate spheroid. The circle will represent the former, the ellipse the latter. A diagram may be constructed in which the circle and ellipse shall have a certain relation to each other as to their diameters, and in which lines drawn from one extremity of the major axis of the ellipse, and making harmonic angles with it, shall intersect the curve of the ellipse at points which mark the most important divisions of the face and head, and thus lay the foundations of a beauty which corresponds to that of the finest specimens of Greek sculpture. I take the following description, and the explanatory plate, from Mr. Hay's last work, "The Science of Beauty," pp. 58—60.

"The angles which govern the form and proportions of the human head and countenance are, with the right angle, a series of seven, which, from the simplicity of their ratios to each other, are calculated to produce the most perfect concord. It consists of the right angle and its following parts:—

Tonic.	Dominant.	Mediant.	Subtonic.
$(\frac{1}{2})$	$(\frac{1}{3})$	$(\frac{1}{5})$	$(\frac{1}{7})$
$(\frac{1}{4})$	$(\frac{1}{6})$		

"These angles, and the figures which belong to them, are thus arranged:—

"The vertical line A B (Plate III. fig. 2) represents the full length of the head and face. Taking this line as the greater axis of an ellipse of $(\frac{1}{3})$, such an ellipse is described around it. Through A the lines A G, A K, A L, A M, and A N, are drawn on each side of the line A B, making, with the vertical, respectively the angles of $(\frac{1}{3})$, $(\frac{1}{4})$, $(\frac{1}{5})$, $(\frac{1}{6})$, and $(\frac{1}{7})$. Through the points G, K, L, M, and N, where these straight lines meet the curved line of the ellipse, horizontal lines are drawn by which the following isosceles triangles are formed, A G G, A K K, A L L, A M M, and A N N. From the centre X of the equilateral triangle A G G the curvilinear figure of $(\frac{1}{2})$, viz., the circle, is described circumscribing that triangle.

"The curvilinear plane figures of $(\frac{1}{2})$ and $(\frac{1}{3})$, respectively, represent the solid bodies of which they are sections, viz., a sphere and a prolate spheroid. These bodies, from the manner in which they are here placed, are partially amalgamated, as shewn in figures 1 and 3 of the same plate, thus representing the form of the human head and countenance, both in their external appearance and osseous structure, more correctly than they could be represented by any other geometrical figures. Thus the angles of $(\frac{1}{2})$ and $(\frac{1}{3})$ determine the typical form.

"From each of the points *u* and *n*, where A M cuts G G on both sides of A B, a circle is described through the points *p* and *q*, where A K cuts G G on both sides of A B, and with the same radius a circle is described from the point *a*, where K K cuts A B.

"The circle *u* and *n* determine the position and size of the eyeballs, and the circle *a* the width of the nose, as also the horizontal width of the mouth.

"The lines G G and K K also determine the length of the joinings of the ear to the head. The lines L L and M M determine the vertical width of the mouth and lips when at perfect repose, and the line N N the superior edge of the chin. Thus simply are the features arranged and proportioned on the facial surface."

That this theoretical calculation by Mr. Hay will bear an experimental test I proved, in a very interesting manner, not long ago. I took the height of a lady's head, measured from the vertex to a horizontal line, drawn at right angles to it from the termination of the chin. This lady is remarkable for the classical beauty of form in her face and head. Upon this line I constructed a diagram, representing the proportions of the profile, as in figure 3—that is, describing a

circle, a dominant ellipse, and the angles of $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{1}{6}$, and $\frac{1}{7}$. The features were sketched in, so as to conform to a Greek model, by my daughter, who was not at all familiar with the lady's face. When the diagram was afterwards applied to the living face and head, the correspondence of the general contour and of the several divisions, forehead, nose, and mouth, was singularly close, and yet the only measurement taken from life was, as I have said, the height from vertex to chin.

The importance of the human figure as a type of Beauty has been recognized in all times. Vitruvius says: "No building can possess the attributes of composition in which symmetry and proportion are disregarded; nor unless there exists that perfect conformation of parts which may be observed in a well-formed human being." In a letter addressed by Michael Angelo to Cosmo I. there is the following passage: "The nose, planted in the middle of the face, does not depend on one or the other eye; but the one hand must necessarily resemble the other, and the one eye should answer to the other, and also relatively to the corresponding parts of the face in which they are placed; so the members of architecture may be said to depend in a certain sense on those of the human body. He who is not a good master of the human figure, and especially of anatomy, cannot comprehend the principle I insist upon."*

To ascertain the due proportions of the human figure various measurements have been proposed; and although they have all yielded some practical success, as guides to drawing and composition, yet they do not impress the mind as having been founded upon any law involving unity of design, or harmonizing with any other facts in the order of nature. Many of the modes of measurement have been very empirical; almost absurdly so. Thus the whole height of the body is the length of the foot so many times repeated, or so many heads; and the proportions of the head are so many noses: and so on.

Carus takes a third of the moveable part of the vertebral column as the unit of measurement; but, as his able reviewer in the Quarterly Review (1856) remarks, "the choice is certainly arbitrary, and the grounds by which he justifies it are fanciful;" though the reviewer adds, "it supplies us with a convenient unit of measurement, and one to which the dimensions of many important parts are closely and very

* Harford's Life of Michael Angelo, vol. ii. p. 185.

simply adjusted." But, according to Mr. Hay's theory, the same principle of measurement which develops beautiful proportions in the human head is not only applicable to the whole figure also, but it likewise yields equally satisfactory results when applied to beautiful forms in architecture and in fictile art.

"The manner of applying this system in imparting proportions to a representation of the human figure, and thereby synthetically developing in it the operation of the law in question, is to adopt, as a fundamental angle, either $\frac{1}{2}$, $\frac{3}{15}$, $\frac{5}{9}$, $\frac{9}{16}$, $\frac{4}{7}$, $\frac{7}{12}$, or $\frac{3}{5}$ of the semicircle, according to whether feminine beauty or masculine power may be the required characteristic of the figure to be represented. For, as in architecture, some structures being designed for temples of worship, and others for castles of defence, their fitness for these purposes will materially affect their respective æsthetic proportions; so likewise in the human figure, the chief characteristic in the typical female form being pure and simple beauty, while that of the typical male form is beauty modified by massive strength; the basis on which each of the figures is constructed might be presumed to have reference to the sensations it would awaken—the one of loveliness, the other of strength. Yet the relative proportions of the parts in each case ought to develop the same æsthetic laws, although in different modes. Such are the qualities of fitness which characterize the beauty of the Venus, as compared with that of the Hercules of the ancients, and render these statues perfect types of the sexes.

"In the above series of angles, the smallest ($\frac{1}{2}$ the semicircle) gives the proportions of the Venus, and the largest ($\frac{3}{5}$ the semicircle) those of the Hercules; so that the intermediate angles may be adapted to all intermediate classes of proportions, such as were imparted by the ancient Greeks to the statues of their other deities and their heroes.

"The angle, adopted as a fundamental or tonic angle (which we shall in the present case suppose to be the first or $\frac{1}{2}$ the semicircle), is divided agreeably to the spontaneous division of the monochord into the following:—

Tonic angles.	Dominant angles.	Mediant angles.	Sub-tonic angles.	Super-tonic angle.
$(\frac{1}{2})$	$(\frac{1}{3})$			
$(\frac{1}{4})$	$(\frac{1}{6})$	$(\frac{1}{5})$	$(\frac{1}{7})$	
$(\frac{1}{8})$	$(\frac{1}{12})$	$(\frac{1}{10})$	$(\frac{1}{14})$	$(\frac{1}{9})$

"From the extremities of a vertical line of a given length, representing the full height of the intended figure (whether its dimensions

are to be those of a small gem, a colossal statue, or anything intermediate in size), a series of oblique lines are drawn, making with it the above angles; then another vertical line is drawn, the situation of which is determined by the intersection of one of the tonic lines, drawn from one extremity, with one of the dominant lines drawn from the other; and to complete the rectilinear portion of the diagram, a series of horizontal lines are added, whose situations are also determined by the intersections of the oblique lines. With this rectilinear portion, a series of curvilinear figures are associated, and these belong to the tonic, the dominant, and the mediant angles, and their sizes and situations are determined by the vertical, horizontal, and oblique lines already drawn. Thus simply may diagrams of the human figure be produced of any required dimensions or characteristic proportions."*

The diagrams of Plate IV. illustrate the following facts; firstly, That on a given line, the figure is developed as to its principal points entirely by lines drawn either from the extremities of this line or from some obvious and determined localities; and secondly, That the angles which these lines make with the given line are all simple multiples or sub-multiples of some given fundamental angle, or bear to it a proportion, admissible under the most simple relations, such as those which constitute the scale of music. The diagrams Plate V. illustrate the curves of the outline of the human figure, viewed in front and in profile. This contour may be resolved into a series of ellipses, governed by the same simple angles; and these ellipses, like the lines, are inclined to the first given line by angles which are simple multiples or sub-multiples of the given fundamental angle.

"Manner in which these curves are disposed in the lateral outline of the human figure as viewed from the front (figure 1, Plate V.):—

	Points.	Curves.
Head	from 1 to 2	$(\frac{1}{2})$
Face	" 2 " 3	$(\frac{1}{3})$
Neck	" 3 " 4	$(\frac{1}{5})$
Shoulder	" 4 " 6	$(\frac{1}{6})$
"	" 6 " 8	$(\frac{1}{4})$
Trunk	" 9 " 15	$(\frac{1}{4})$
"	" 21 " 24	$(\frac{1}{2})$
Outer surface of thigh and leg	" 15 " 20	$(\frac{1}{6})$
Inner surface of thigh and leg	" 25 " 30	$(\frac{1}{6})$
Outer surface of the arm	" 8 " 33	$(\frac{1}{6})$
Inner surface of the arm	" 9 " 36	$(\frac{1}{5})$

* Hay's Natural Principles of Beauty, pp. 9—11.

"Manner in which they are disposed in the outline of the human figure as viewed in profile (figure 2, Plate V.) :—

	Points.	Curves.
Front of neck - - - -	from 1 to 2	$(\frac{1}{6})$
" " trunk - - - -	" 2 " 10	$(\frac{1}{4})$
Back of neck - - - -	" 16 " 18	$(\frac{1}{6})$
" " trunk - - - -	" 18 " 23	$(\frac{1}{4})$
" " " - - - -	" 23 " 25	$(\frac{1}{3})$
Front of thigh and leg - -	" 11 " 13	$(\frac{1}{4})$
" " " - -	" 13 " 15	$(\frac{1}{6})$
Back of thigh and leg - -	" 25 " 32	$(\frac{1}{6})$
Front of the arm - - -	" 33 " 37	$(\frac{1}{6})$
Back of the arm - - -	" 38 " 40	$(\frac{1}{6})$
Foot - - - - - -	" 0 " 0	$(\frac{1}{6})$

"In order to exemplify more clearly the manner in which these various curves appear in the outline of the figure, I give in Plate VI. the whole curvilinear figures, complete, to which these portions belong that form the outline of the sides of the head, neck, and trunk, and of the outer surface of the thighs and legs.

"The axes of these ellipses form angles with the vertical line, which bear the following harmonic ratios to the right angle :—

Parts of Outline.	Angle to which the curve belongs.	Angle of inclination of major axis of curve.
From 1 to 2 - - -	$(\frac{1}{2})$ - - -	(0)
" 2 " 3 - - -	$(\frac{1}{3})$ - - -	(0)
" 3 " 4 - - -	$(\frac{1}{5})$ - - -	(0)
" 4 " 5 - - -	$(\frac{1}{6})$ - - -	$(\frac{1}{5})$
" 5 " 6 - - -	$(\frac{1}{6})$ - - -	$(\frac{8}{9})$
" 6 " 8 - - -	$(\frac{1}{4})$ - - -	$(\frac{1}{7})$
" 9 " 10 - - -	$(\frac{1}{4})$ - - -	$(\frac{2}{9})$
" 10 " 11 - - -	$(\frac{1}{4})$ - - -	$(\frac{1}{6})$
" 11 " 13 - - -	$(\frac{1}{4})$ - - -	$(\frac{1}{2})$
" 13 " 15 - - -	$(\frac{1}{4})$ - - -	$(\frac{1}{5})$
" 15 " 16 - - -	$(\frac{1}{6})$ - - -	$(\frac{1}{6})$
" 16 " 18 - - -	$(\frac{1}{6})$ - - -	$(\frac{2}{9})$
" 18 " 19 - - -	$(\frac{1}{6})$ - - -	$(\frac{1}{6})$
" 19 " 20 - - -	$(\frac{1}{6})$ - - -	$(\frac{1}{3})$

"Thus there is a perfect harmony of combination in the proportions of the human figure, associated with as perfect a harmony of succession in its beautifully undulated outline, the curves of which rise and fall in ever-varying degree, and melt harmoniously into one another like the notes of a pleasing melody."*

* Op. cit. pp. 20—22.

Mr. Hay, in conjunction with two gentlemen of eminent authority in science, Professor Kelland, Professor of Mathematics in the University of Edinburgh, and Professor Goodsir, Professor of Anatomy in the same University, applied this system of measurement to the living model, and to those exquisite remains of Greek sculpture—the Venus de' Medici and the Venus of Melos; and the result was quite satisfactory, as showing the agreement of the proportions of the several figures with those which are defined in the harmonic theory.

The proportions in works of architecture may be examined on the same principles as those which have been applied to the human face and figure. Let us follow Mr. Hay, first, in his examination of the front portico of the Parthenon of Athens. "Of all the monuments," says Mr. Kinnaird, "of ancient and modern magnificence which have been within our view, the grandeur of this (the Parthenon) alone surpassed anticipation, leaving an impression on the mind similar to, but more profound, than the charms of an harmonious fugue or of a rapturous effusion of poetry."

"The angles which govern the proportions of this beautiful elevation are the following harmonic parts of the right angle:—

Tonic Angles.	Dominant Angles.	Mediant Angles.	Subtonic Angles.	Supertonic Angles.
$(\frac{1}{2})$	$(\frac{1}{3})$	$(\frac{1}{5})$	$(\frac{1}{7})$	$(\frac{1}{9})$
$(\frac{1}{4})$	$(\frac{1}{6})$	$(\frac{1}{10})$		$(\frac{1}{18})$
$(\frac{1}{8})$				
$(\frac{1}{16})$				

"In Plate VII. I give a diagram of its rectilinear orthography, which is simply constructed by lines drawn either horizontally, vertically, or obliquely, which latter make with either of the former lines one or other of the harmonic angles in the above series. For example, the horizontal line A B represents the length of the base or surface of the upper step of the substructure of the building. The line A E, which makes an angle of $(\frac{1}{5})$ with the horizontal, determines the height of the colonnade. The line A D, which makes an angle of $(\frac{1}{4})$ with the horizontal, determines the height of the portico, exclusive of the pediment. The line A C, which makes an angle of $(\frac{1}{3})$ with the horizontal, determines the height of the portico, including the pediment. The line G D, which makes an angle of $(\frac{1}{7})$ with the horizontal, determines the form of the pediment. The lines E Z and L Y, which respectively make angles of $(\frac{1}{16})$ and $(\frac{1}{18})$ with the horizontal, deter-

mine the breadth of the architrave, frieze, and cornice. The line *v n u*, which makes an angle of $(\frac{1}{3})$ with the verticle, determines the breadth of the triglyphs. The line *t d*, which makes an angle of $(\frac{1}{2})$, determines the breadth of the metops. The lines *c b r f*, and *a i*, which make each an angle of $(\frac{1}{6})$ with the vertical, determine the width of the five centre intercolumniations. The line *z k*, which makes an angle of $(\frac{1}{8})$ with the vertical, determines the width of the two remaining intercolumniations. The lines *c s*, *q x*, and *y h*, each of which makes an angle of $(\frac{1}{10})$ with the vertical, determine the diameters of the three columns on each side of the centre. The line *w l*, which makes an angle of $(\frac{1}{9})$ with the vertical, determines the diameter of the two remaining or corner columns.

"In all this, the length and breadth of the parts are determined by horizontal and vertical lines, which are necessarily at right angles with each other, and the positions of which are determined by one or other of the lines making the harmonic angles above enumerated.

"Now, the lengths and breadths thus so simply determined by these few angles have been proved to be correct by their agreement with the most careful measurements which could possibly be made of this exquisite specimen of formative art. These measurements were obtained by the 'Society of Diletanti,' London, who, expressly for that purpose, sent Mr. F. C. Penrose, a highly educated architect, to Athens, where he remained for about five months, engaged in the execution of this interesting commission, the results of which are now published in a magnificent volume by the Society.* The agreement was so striking, that Mr. Penrose has been publicly thanked by an eminent man of science for bearing testimony to the truth of my theory, who in doing so observes, 'The dimensions which he (Mr. Penrose) gives are to me the surest verification of the theory I could have desired. The minute discrepancies form that very element of practical incertitude, both as to execution and direct measurement, which always prevails in materialising a mathemetical calculation made under such conditions.'"

After a similar illustration of the proportions of the portico of the Temple of Theseus, Mr. Hay goes on to remark:—

"The foregoing examples being both horizontal rectangular compositions, the proportions of their principal parts have necessarily been determined by lines drawn from the extremities of the base, making

"* Longman and Co., London."

angles with the horizontal line, and forming thereby the diagonals of the various rectangles into which, in their leading features, they are necessarily resolved. But the example I am now about to give is of another character, being a vertical pyramidal composition, and consequently the proportions of its principal parts are determined by the angles which the oblique lines make with the vertical line representing the height of the elevation, and forming a series of isosceles triangles; for the isosceles triangle is the type of all pyramidal composition.

"This third example is the east end of Lincoln Cathedral, a Gothic structure, which is acknowledged to be one of the finest specimens of that style of architecture existing in this country.

"The angles which govern the proportions of this elevation are the following harmonic parts of the right angle :—

Tonic.	Dominant.	Mediant.	Subtonic.	Supertonic.
$(\frac{1}{2})$	$(\frac{1}{3})$	$(\frac{1}{5})$	$(\frac{1}{7})$	$(\frac{2}{9})$
$(\frac{1}{4})$	$(\frac{1}{6})$	$(\frac{1}{10})$		$(\frac{1}{9})$
	$(\frac{1}{12})$			

"In Plate VIII. I give a diagram of the vertical, horizontal, and oblique lines, which compose the orthography of this beautiful elevation.

"The line A B represents the full height of this structure. The line A C, which makes an angle of $(\frac{2}{9})$ with the vertical, determines the width of the design, the tops of the aisle windows, and the bases of the pediments on the inner buttresses; A G, $(\frac{1}{5})$ with the vertical, that of the outer buttress; A F, $(\frac{1}{9})$ with the vertical, that of the space between the outer and inner buttresses and the width of the great centre window; and A E, $(\frac{1}{12})$ with vertical, that of both the inner buttresses and the space between these. A H, which makes $(\frac{1}{4})$ with the vertical, determines the form of the pediment of the centre, and the full height of the base and surbase. A I, which makes $(\frac{1}{3})$ with the vertical, determines the form of the pediment of the smaller gables, the base of the pediment on the outer buttress, the base of the ornamental recess between the inner and outer buttresses, the spring of the arch of the centre window, the tops of the pediments on the inner buttresses, and the spring of the arch of the upper window. A K, which makes $(\frac{1}{2})$, determines the height of the outer buttress; and A Z, which makes $(\frac{1}{6})$ with the horizontal, determines that of the inner buttresses. For the reasons already given, I need not here go into further detail.* It is, however, worthy of remark in this place,

"* For further details, see 'Harmonic Law of Nature,' &c."

that, notwithstanding the great difference which exists between the style of composition in this Gothic design, and in that of the east end of the Parthenon, the harmonic elements upon which the orthographic beauty of the one depends are almost identical with those of the other."*

The mouldings of the Parthenon have contours composed of curves derived from the composite ellipse—a figure so named "because it is composed simply of arcs of various ellipses, harmonically flowing into each other. The composite ellipse, when drawn systematically upon the isosceles triangle, resembles closely parabolic and hyperbolic curves —only differing from these inasmuch as it possesses the essential quality of circumscribing harmonically one of the elementary rectilinear figures employed in architecture, while those of the parabola and hyperbola, as I have just observed, are merely curves of motion, and, consequently, can never harmonically circumscribe or be resolved into any regular figure."

For the description of this figure, I must refer my readers to Mr. Hay's works.

In the analysis of the proportions of the east front of Lincoln, it will have been seen that the measurements have been made by means of lines drawn at certain angles from the extremity of a line representing the height, these lines being inclusive of the principal members of the building, architecturally considered. But I am inclined to think that the harmonies most felt by the eye, in traversing a Gothic building, are those which result from the leading features, that is to say, from the ratios in which the angles, which govern those parts, combine with each other. There may be a *structural* harmony, as in the skeleton of the human form, independent of the proportions of the curves which make the contour,—but it is the contour which takes the eye. So also in Gothic architecture the forms of the most prominent parts of the building—the spire, the tower, the windows, the pediments, the buttresses,—and the proportions which their angles severally bear to each other as divisions of a right angle—are what dwell on the mind. Thus I find in Salisbury Cathedral a great prevalence of dominants and supertonics, which give a ratio 3 : 4. The governing angle of a Gothic window I take to be that which is formed by a line drawn from the apex to the spring of the arch, and a vertical line

* Hay's Science of Beauty, pp. 40—45.

which is drawn from the apex and bisects the window. Another line, drawn from the same point to the extremity of the line which marks the base of the window, gives an angle, which, compared with the former, determines the proportions of the whole window. The most beautiful windows are those of the Early English and the Decorated styles. Their ratios I find to be either 1 : 2 or 2 : 3.

I cannot conclude this section without bringing forward what appears to me to be a very interesting confirmation of Mr. Hay's views of proportion. When reading an admirable biography of Michael Angelo, lately published by Mr. Harford, I was struck with one of the plates which represents St. Peter's as designed by M. Angelo, and contrasted with St. Peter's as it now stands. The most superficial observer cannot fail to notice the superiority of the former, both as to grandeur of effect and as to beauty of proportion. The eye passes, by an easy and gradual transition, from the curves of the vast dome, through those of the smaller cupolas, to the rectilinear forms of the façade, which present a most harmonious combination of variety with unity. The principal cause of the inferiority of the present design is the elongation of the nave, which thrusts the portico and façade to a great distance from the dome. This elongation "was still more fatal," says Mr. Harford, "to the exterior beauty of the church, than to that of the interior; for the cupola, on approaching the grand façade, is cut through in perspective by its upper story, and is therefore half concealed from the eye, instead of triumphing as the sublime and presiding feature of the whole edifice."*

As the inequality of these two designs was so remarkable, it occurred to me that it would offer a good opportunity of testing Mr. Hay's system of diagonal ratios. I therefore, after including the curves in parallelograms, made a series of diagonals through all the principal parts of the building in the two designs. The resultant ratios of the angles afforded a most satisfactory confirmation of Mr. Hay's harmonic system.

In Michael Angelo's design they were 2 : 3, 3 : 4, 1 : 2, and 9 : 10.

In St. Peter's *as it is*, the ratios came out thus; 7 : 11, 7 : 18, 15 : 24, and 7 : 15.

Now, after considering these several instances in which the measurements of forms of acknowledged beauty correspond so wonderfully

* Harford's Life of Michael Angelo, vol. ii., page 98.

with harmonic ratios, I do not see that, even if no further explanation were to be given, we could avoid the conclusion that the results which have been stated are not merely accidental, but that they rest on the nature of things, and that to Mr. Hay belongs the rare merit of having been the first to bring æsthetical observation within the range of definite science—at least with reference to Beauty of Form.

For the following attempt to explain the pleasure derived from Beauty of Form upon physiological principles I alone am responsible, though I am happy to say that Mr. Hay concurs in it.

If it be allowed that certain arrangements of lines in figures which give rise to the feeling of symmetrical beauty may be resolved into certain geometrical and numerical harmonies, we have still to inquire why these latent harmonies create pleasure. The numerical relation of sounds has been known for ages; but as to forms, many generations of men have continued to draw delight and admiration from them without the slightest suspicion of any such relations or proportions. Without carrying the analysis farther, I think we are entitled to say that, if in objects which are undeniably beautiful there are found those remarkable proportions in *space* which correspond with those proportions in *time*, which are known to give pleasure to the ear, such proportions must have a correlation to those ultimate actions in the sensorium which precede the feeling of visual pleasure. Of the nature of those actions we are at present ignorant. But there is a well-ascertained source of satisfaction or enjoyment which is closely concerned with these æsthetical feelings, and to which I have more than once alluded, though slightly. Our eyes trace lines and measure spaces by means of muscular actions. Neither a general survey of an object, nor a minute examination of it, is possible,—no curves can be followed, nor spaces traversed—without muscular movements of the eyeball. Muscular action gives birth to pleasurable or uneasy feelings —seldom, however, in the muscles themselves—according as they are accomplished with ease or difficulty. Rhythmical muscular action is more easy and agreeable than that which is irregular.

I have already spoken of the displeasing effect of an irregular jagged line; part of the discomfort of which may be owing to the sudden checks and inequalities of the muscular movements of the eye. Let any one merely follow a series of horizontal lines drawn on paper, and then try a series which traverse the page in angles which

bear no proportion to each other, and he will inevitably be the subject of a feeling of fatigue and disgust.

Geometrical and arithmetical proportions govern the material universe. It is not likely that our organs of sensation should afford an exception to the general fact. And when we can describe any of our experiences in terms which admit of numerical expression, we not only attain to accuracy of representation, but we are also bringing the fact within the scope of the most universal laws. The Ego sent into the world to feel pleasure is set in tune to the various harmonies in nature, and to thrill with responsive pleasure.

Regularity of form belongs to our most simple and ordinary arrangements in daily life. Every article of manufacture exhibits it. Without it space would be occupied at the greatest disadvantage. Confusion would be inevitable. There would be no practical circumscription of space, nor remembrance of place. The process of *fitting* or mutual adaptation, can only be secured by regularity of form. And the same applies to the equal and regular divisions of time;—the whole mechanism of life depends upon it.

As an equal or proportionate division of space is necessary to method, so also a like division of *time* is essential to orderly *movement*. If men were not to march in time they could not be kept together in space; that is, the groups or companies could not be maintained in the requisite configurations. Moreover action is easier, as we have already remarked, when performed in strict adaptation to regular divisions of time, as in marching to music, or in working to a song.

Our neurological conditions at first sight seem antagonistic to, or inconsistent with, mechanical arrangements. We talk of spiritual forces superseding the mechanical arrangements of matter: but the probability is that even those forces obey the same laws to which the whole world is subordinated. Thoughts, sentiments, and emotions do not seem measurable in space and time. But the æsthetical arts are those which bring the operations of the mind into contact or co-existence with rhythmical sensations or actions. What is the difference between poetry and prose? The thoughts, images, and emotions called forth may be identical. But in poetry there is a measured arrangement of the sounds of which the words are constituent. This pleasure of sense is combined with the pleasure of thought and emotion, and makes poetry æsthetical.

As *vision* is a muscular as well as sensory action, it is highly

probable, as we have already remarked, that the movements of the eye are most agreeable when under regular and rhythmical direction, though we may be quite unconscious of such regularity of action. Indeed there is an instinctive tendency to rhythm manifested in all muscular actions, from the rocking of a cradle, or the see-saw of a nurse's arms, to the most exquisite harmonies in the steps of a Taglioni. Children when happy, even in their little feasts, may be observed to beat time. Adults are disposed to sing, or hum, or dance, when subject to pleasant emotion. Philosophers, arriving at a satisfactory solution of some problem, may be seen to swing an arm or a stick in a measured movement. Under solemn emotion the gait becomes strictly measured;—but under vexation we beat the Devil's Tattoo. Speech issuing from grand emotion tends to rhythmical cadences. Counting and measuring are those slight exercises of mind to which it is sometimes compelled by circumstances. Persons confined to bed are not unfrequently fatigued by the solicitations to this exercise, made by the eyes, which catch patterns in the curtains and wall-paper. To make the steps coincide with the pattern of a carpet, or with the flags of a pavement, is parallel to the beating of time with the hand, or walking to the time of music. In the vacuity and exhaustion of mind left by violent emotion men fall into like automatic actions of mind and muscle. They stand by the coffins of their dearest friends, and, in their desolate abstractedness of mind, mechanically count the nails in the coffin-lid, or measure the quarters of the escutcheons. But I need not multiply instances.

Now it is not likely that, from the generality of this fact, as to the whole muscular system, the muscles of the eye should present an exception. On the contrary, when we observe the great mobility of the organ, and the wonderful equipoise in the antagonism of its muscles, we might expect that their action would require a certain rhythm to make them agreeable; but if the spaces over which the eyes are carried have definite proportions to each other, it follows that the movements of the eyes will bear like proportions. *Such proportioned movements, then, are rhythmical,* and may be capable of infinite variety; that is, they may be as extensive as the variety of harmonious forms; and, in all that regulated harmonious variety, they may afford exquisite feelings of pleasure. In fact the eyes may be said to beat time to a visual music, or to dance in concert with the flowing melody of the curving outlines they follow, or to thread with tuneful steps the

mazes of beautiful proportions, unconscious all the time that they are,

> "With wanton heed and giddy cunning,
> Untwisting all the chains that tie
> The hidden soul of harmony."

Dancing consists of regular movements in divisions of time determined by sound, and the pleasure of the action is quite apart from the delight in the music, though concurrent with it. Looking, then, at a symmetrical form, according to the view which I now venture to propound, consists in moving the eye over spaces measurable by angles of definite proportions; and the movements thus executed are followed by a feeling of pleasure which is akin to that of dancing, being, generally, however, concurrent with other causes of pleasure, such as the colour or expression of the object. The sense of harmony or proportion arises in the mind without any distinct understanding of the causation. The mind is content to accept the pleasure without recognizing its source.

While it is interesting to trace the combination of harmonic proportions as one of the sources of Beauty, we must still bear in mind that it is only one. With the geometrical beauty of the Parthenon would be combined the pleasant impression of the light reflected from the marble, the alternation of shade, the carving of the decorations, and the emotions excited by the sculptured figures, independently of the proportions of these figures. In a Gothic building the influence would be still more composite. When we take into consideration the continuities of lines, the contrasts of light and shadow, oftentimes the glory of coloured windows, generally the endless variety of decorative appendages, and all the associations derived from the purposes of the building, it is obvious that many different elements of beauty are operating upon us at one and the same time. If this remark holds good as to the æsthetics of architecture, it must be, *à fortiori*, applicable to the pleasure derived from the contemplation of a beautiful human figure. This is so obvious that we need not enter into any further explanation.

It will have been noticed that Sensational Beauty, as governed by similarity, continuity, and variety, has been illustrated chiefly through Form.

Incidental allusion has been made to gradations of light and shade, and to harmony of colour. It would seem to be a somewhat incom-

plete discussion of Beauty through sense were colour to receive no further consideration; and yet the subject, if to be treated at all, would require more knowledge of the details than I possess, and more space than my limits will allow. Certainly, I have nothing to add to what has been fully explained in many recent works on the subject. It is enough for me to say that the more the subject is inquired into, the more striking will be the illustrations of the principle, that pleasure is derived from that tempering of contrast with likeness which is found to belong to the harmonies of form and sound.

Mr. Field was the first to give numerical expression to the relative intensities of the three primary colours, and to point out an analogy between the harmonious adjustment of these primaries to their complementary colours, and the common chord of music. Mr. Hay, who, in a work* published many years ago, assigned the merit of discovering this analogy to Mr. Field, has carried it further, and has arranged a diatonic scale of colours in a series of octaves; but with what degree of success I do not presume to decide.† The pleasure derived from

* Laws of Harmonious Colouring, 3rd edition. 1836.

† I feel so much indebted to Mr. Hay for the instruction which I have derived from his writings, that, although it does not bear immediately on my subject, I cannot omit the mention of one of his claims as a discoverer, which he has stated in the following passage, extracted from his "Laws of Harmonious Colouring:"—

"Although I could not, by analysis, prove that there were only three colours, I succeeded in proving it to my own satisfaction, synthetically, in the following manner:—After having tried every colour in succession, and finding that none of them could be separated into two, I next made a hole in the first screen in the centre of the blue of the spectrum, and another in that of the red. I had thereby a spot of each of these colours upon a second screen. I then, by means of another prism, directed the blue spot to the same part of the second screen on which the red appeared, where they united and produced a violet as pure and intense as that upon the spectrum. I did the same with the blue and yellow, and produced the prismatic green; as also the red and yellow, and orange was the result. I tried, in the same manner, to mix a simple with what I thought a compound colour, but they did not unite; for no sooner was the red spot thrown upon the green than it disappeared.

"I tried the experiment with two spectrums, the one behind, and, of course, a little above the other, and passed a spot of each colour successively over the spectrum which was farthest from the window, and the same result occurred. It therefore appeared to me that these three colours had an affinity to one another that did not exist in the others, and that they could not be the same in every respect, except colour and refrangibility, as had hitherto been taught.

"These opinions, the result of my experiments, I published in 1828, as being a necessary part of a treatise of this nature; and I did so with great diffidence, well knowing that I was soaring far above my own element, in making an attempt to throw light upon such a subject. I had, however, the gratification to learn that these facts were afterwards proved in a communication read to the Royal Society of Edinburgh by Sir David Brewster, on the 21st of March, 1831, in which he showed that white light consists of the three primary colours, red, yellow, and blue; and that the other colours shown by the prism are composed of these."—Pp. 10, 11, 5th edition.

Form has, it appears to me, and as I have endeavoured to show in this section, a different source from that to which colour can be referred.

Having analysed the pleasure derived from similarity, we now return to variety, as a source of Beauty. The delight in new impressions, the sense of change, and of action;—this is what may be considered the most popular kind of Beauty. For the appreciation of symmetry, a certain amount of culture is needful; but new colours and unaccustomed forms may at once attract attention and impart pleasure to the most simple and uneducated minds.

The feelings induced are closely related to the desire for knowledge, whether it be that which consists of additions to previous experience or that which is derived from the arrangement of what we know in new combinations. And under the operation of agencies which bring such novelties and varieties the mind has a consciousness of pleasant activity analagous to the enjoyment of muscular exercise.

It is this ministration which accounts for most of the pleasure produced by natural scenery, whether in the variety of surface presented by undulations of hill and dale, or in the ever-changing effects from new distributions of rays and colours, and shadows, or in the irregularly-winding courses of brooks and rivers, or in the endless diversities of forms in flowers, and herbs, and trees, and in the animated tribes which people the scenes of beauty. And yet in all these objects it is to be noted, that, though variety is a prevailing element, yet there is a large intermixture of similarity. A tree presents constant change of direction in the branches, the boughs, and twigs, yet we cannot but observe the similarity of the leaves to each other, and the uniformity of their colour; and irregular as may be the lines of the branches and twigs, yet, on examination, we may find more regularity in the intervals of division, and in the angles of divarication, than might at first have been expected.

This, too, is ever to be borne in mind, that, however great may be the charm of variety, expression, and change of movement, there is still a deep desire in the eye and in the mind for repose. The rustling of the foliage by wind may give a temporary animation to the grove;—it may be pleasant to see the surface of the lake crisped by a passing breeze; and there is undoubted fascination in features which show the play of various emotion: but foliage more frequently in agitation than

at rest—a lake oftener ruffled than calm—a face always changing its expression—would induce a feeling in the spectator far less agreeable than even the monotony and lifelessness of unbroken repose.

How, then, are we to account for the undeniable fact, that if a face, though defective in contour and symmetry, is expressive of certain mental states or emotions, it is universally preferred to one which is faultlessly regular, but wanting in expressiveness? The answer is, that in the human being we require more than fine configuration of feature; we desire certain qualities of heart and mind, betokened in what we term a pleasing, as distinguished from a beautiful face. In saying that *this* is the more beautiful, *that* the more pleasing face, we imply that we prefer the beauty of emotion or mind to that of sense; yet still we unconsciously refer to a standard of beauty involving the idea of symmetry or harmonious colour. The face which is pleasing in expression is, we say, *beautiful in expression.* We have pleasure in both—a greater pleasure in the expressive one; but that which we characterize as beautiful, *par excellence*, is that which is of a certain mould and colour. The pleasure, however, which is derived from mere physical beauty of face can never compete with that which is an indication of beauty of character.

In works of art the repetition of mere typical forms of beauty is very apt to beget a tame and insipid style. Such were the academic conventionalities against which there has been so violent a reaction in the present day. As if weary of forms of beauty, because by iteration without variety they had become stale and effete, a class of artists, endowed both with genius and industry, started up a few years ago with the seeming intention of compelling us to admire faces which express life, passion, and sentiment—though devoid of all beauty of configuration. The movement, notwithstanding the fiery zeal and eloquence of its prophet, and the smiles and applause of fashion, will not be ultimately successful. A revolution which mistakes the reverse of wrong for right is sure to fail. The lovers of beauty, preferring what is dull to what is offensive, will rather doze over the inanities and insipidities of a drowsy dilettantism, than choose to be irritated into wakeful attention by ugly contours, disproportioned figures, and ill-assorted colours, drawn and arranged after the hard and ignorant manner of the early Christian painters, and imbued with the childish symbolism of the dismal Middle Ages.

But if a living face charged with pleasing expression, though pos-

sessing no claims to regular beauty, delights us more than its converse, it might be expected that, if one or the other must be chosen, we should request the artist, except when he is engaged on a portrait, to present us with the expressive rather than with the merely beautiful face. But the cases are different; for while the chief attraction of the living face is the play of varying thought and emotion, in a work of art only one expression can be rendered; and if it represents nothing but that one expression we become weary of it. There is a statue in one of the courts of Edinburgh, of Duncan Forbes, by Roubiliac, which, seen for the first time, is almost sure to elicit some such an exclamation as "What wonderfully life-like energy and animation!" Few persons of taste, however, would wish to be often in the presence of that restless figure; they would even rather desire to have perpetuated before them the calm stolidity of the most impassive judge that was ever turned into congenial stone.

The severance of beauty of form from beauty of expression is an unnatural divorce. It is as much opposed to a true æsthetical philosophy as an attempt to produce poetry without the melody of verse.

Even where variety of lines and forms is most natural, as in the grouping of human or angelic figures in a picture, it will be found that the arrangement is most agreeable to the eye, when, without formality, there is a certain degree of symmetry, as when one side of the picture somewhat corresponds to the other, without conspicuously balancing it. A parallelism which does not strike the eye, and yet may be traced in the direction of the limbs—the figure of a pyramid, or an ellipse, or a rectangle, which may be traceable to the eye which looks for it, though it does not in the least approach to actual definition,—such arrangements, by a virtual conformity to symmetry, without any marked appearance of it, give unquestionable pleasure to our sight. In natural objects, as I have already hinted, where there is the greatest apparent diversity, it is easy to trace the law of uniformity. In foliage there is not only the general likeness of the leaves and branches, but the direction or the relative position of the leaves is in a great measure uniform, and a departure from it produces an impression of confusion or discomposure which may even cause us to attribute unhealthiness to the plant or tree in which we observe this derangement.

Grace—that is, beauty in motion and attitude—is a striking illustration of the union of the two principles of similarity and variety.

For the secret of graceful action is that the symmetry is preserved through all the varieties of position.

In our analysis of certain beautiful combinations of form, as presented by the human face and figure, and in works of architecture, we found lines, angles, and curves, associated in a manner delightful to the sense of symmetry. Independently of the pleasure derivable from the subtle harmony which pervades such proportions, there is a more superficial element of pleasure belonging to the mere contrast or variety afforded by such diversity of lines. "How exquisite and beautiful," says Mr. Field, "is the play of the primary figures in the human countenance!—the *arched* or *curved* brows, the *circular* and *globular* eyes, the *angular* and *pyramidal* nose, the *linear* mouth, and all the graces, forms and flexures of line and contour by which they insensibly vary and combine in the formation of the most beautiful and expressive of all Heaven's works!"*

To some minds novelty or variety is the strongest want. Athens and Rome, the loveliest and grandest scenes in Italy and Switzerland, may have been only once visited by individuals, who, instead of returning to the same places, will choose to wander through unvisited countries, in search of new impresssions and new excitement. In a mind absolutely *blasé* there is a prurient desire for mere novelty. Even deformity and grotesqueness are craved for by one sense, just as strange compounds which are sour, bitter, and nauseous to the unsophisticated, can alone stimulate another sense. This, however, is chiefly seen in those who have not cultivated their mental faculties, and whose taste for similarity has not been developed in those comparisons of the judgment, in which the common generalizations of science consist—nor in the intelligent contemplation of works of art.

In closing this division of the subject, let us sum up by remarking that symmetry is repose, variety is action. Variety is pursuit, and symmetry is fulfilment. In the one there is expectation, in the other, satisfaction. In variety the mind unfolds itself; in symmetry it returns upon itself. A parallel for variety may be found in youth and growth; for symmetry, in perfection and maturity. The radius is the type of unity,—the circumference, of variety. Beauty moves between the centripetal and centrifugal forces, but her favourite orbit is an ellipse.

* Analogical Philosophy, vol. ii., p. 135.

III.

The most obvious source under the head of Intellectual Beauty is Memory, or the reproduction of objects and images in themselves beautiful or productive of associations which invest them with beauty, in accordance with what we shall speak of presently as Emotional Beauty.

There are many occasions in which the results of the operations of the judgment give us a feeling of satisfaction which we call beautiful. A piece of comman workmanship may be submitted to us; and, on examination, we find the parts so well fitted, and the surface so well polished, that our satifaction leads us to say that it is a beautiful piece of work. Or we inspect some new invention; and, on finding that the means produce the intended result with certainty and precision, we pronounce it a beautiful invention, thereby expressing the admiration which it excites in our minds. And this admiration may be excited whether the effect be produced by great simplicity of means, or by a complication of arrangements so well ordered that they all work harmoniously to the desired end. When speaking of similarity and novelty, I hinted that the bringing of a number of familiar phenomena under the operation of one law, or the perception of an analogy or likeness of relations between things generally considered different, afforded one kind of pleasure, and the discovery of new phenomena gave another kind. Both of these kinds of pleasure answer to the word Beautiful. Again, we apply this term to a lucid statement, or to a well-connected train of reasoning. The mind delights in detecting unexpected similarities from the perception of a simple proportion in the angles of a triangle up to the discovery or demonstration of the most spacious generalizations of Philosophy. In these, and all the other instances of Beauty through intellect, it it will be observed that *degree* is an important element. When the excellence of the work, or of the induction, or of the reasoning, is such as to create not only satisfaction but admiration, it is designated as Beautiful.

In the operations of Fancy and Imagination we might trace like examples; but in these there is the danger of confounding the pleasure derived from the images themselves, and the associated emotions, with that which arises from their collocation. And indeed if it be merely

collocation, *Wit* is the word which is often employed, rather than beauty; surprise and unexpectedness being the chief elements. When the images are alike only in one or two points, and in others incongruous, they belong to Humour. But when the things associated are in themselves beautiful, then we only use the word beauty as pertaining both to the things themselves and to the fact that they are unexpectedly brought together.

To this head must be referred the beauty which belongs to Literature. The Belles Lettres are works which in their very subject-matter tend to excite that mental enjoyment, the cause of which, whencesoever derived, is designated Beauty. But the mere composition of a literary work, independently of its subject-matter, may be such as to invest it with this character. Let it be a mere scientific exposition, or a close argument, or a narrative of uninteresting events, the phenomena may be arranged with such method, the several steps of the reasoning be so distinctly marked and linked in such happy sequence, and the events recounted in such lucid order, as to give the reader a feeling of admiration, which instinctively brings to his lip the word Beautiful. But when a story, replete with stirring or touching incidents, representing scenes of beauty in nature, and introducing characters of moral beauty, is told in words which, by their harmony of sound, their nicety of adaptation, and their power of suggesting correlative emotions and sentiments, enhance the pleasure which even the scenes, the actions, and the persons would call forth without such reflected charms of style,—when, in a word, we have such a recital as that with which Mr. Macaulay indulges his readers, no one hesitates to affix to it the epithet Beautiful. But in this case there are more elements than the simple intellectual beauty;—they are such as are found in the impassioned argument of an orator who knows how to dispose his hearers to the reception of his views by exciting those feelings of pleasure and admiration which follow displays of rhetoric. Poetry, which is "Beauty's consummate flower" in literature, is of still more complex constitution, deriving its elements from every one of the departments under which we are attempting to consider this subject,—calling up images of beautiful sights and sounds, thoughts tastefully arranged and decorated, and ideal conceptions of goodness and loveliness far transcending the actual,—awakening every species of emotion and passion,—and thus drawing upon the stores of Intellectual, Moral, and Emotional Beauty by words which in their metrical arrangement have a Sensational Beauty of their own.

The Beauty of Science might, like that of literature, be found to involve more elements than the simple intellectual, though they are not so numerous as in the former. Were a philosopher, without any eloquence, merely to set forth the grand phenomena and forces displayed in the mechanism of the heavens, or in the construction of the earth, he would excite sentiments of admiration derived from a contemplation of the power of the Deity and of the arrangements of His Providence, as well as of the position of man in relation to these wonderful works; —but when such themes are treated by a Herschel, a Lyell, or a Forbes, the beauty of literature is added to that of science.

It is interesting, in reference to Intellectual Beauty, to trace the same influence of the opposite principles of similarity and variety upon which we have already commented. New facts and even strange, anomalous, and insulated phenomena are welcomed by the mind which delights in variety. Order, method, analogy, unity of plan, laws, are required for the satisfaction of minds in which the love of symmetry prevails. The highest works of Art or of Literature are those which fully satisfy the taste for symmetry; and which yet, either, in the complexity of forms, colours, and sounds, afford occasions to the mind for discovering new beauties in the physical arrangements, or suggest new associations, or present objects, sentiments, and emotions in new combinations; and all this with continual pleasurable surprises in the adaptation of the *material* of the Art to the purpose accomplished. Thus the opposite principles of light and shade are gently graduated, diverse colours are blended, marble is made plastic, and words are compelled into groups, which, in their literal meaning, or in their symbols and metaphors, bring an array of fresh images, reflections, sentiments, and emotions, and at the same time, by their individual euphony, their rhythm and their metre, the melody of their clauses, and the "linked sweetness" of their harmonious periods, delight the sense of hearing, and minister to the love of order in time and space.

IV.

We have more than once had occasion to use the term Moral Beauty, but we could not pause to define it. It represents the impression made upon our minds by the contemplation of certain human actions or characters. The performance of duty, the practice of goodness, charity, and

benevolence, the exhibition of certain active qualities of soul, such as resolution, courage, and bravery, or of such passive virtues as patience, forbearance, and resignation,—all these may be observed and may beget in the observer's mind no other feeling than that of approval. But when these performances, practices, and endurances, are of a kind or degree that calls forth the warmer feeling of admiration, expressed in praise and applause, they are entitled to the epithet beautiful. We instinctively use his word when we see that integrity and purity have been preserved in spite of temptation, that good has been done to others through self-denial, or by encountering toil, and pain, and peril; and that injury from man, and chastisement from heaven, have been received without revenge, or even bitterness—without rebellion, or even murmuring. But putting aside the splendour of such triumphs of the good over the evil principle, or the manifestation of such high and brilliant virtues, the lives and conduct of many persons present actions so graceful, a considerateness so refined, such tenderness of sympathy, and so delicate a shrinking from the possibility of doing violence to the feelings of others, that to these also we do not hesitate to apply the character of Moral Beauty, because we cannot behold them without pleasure and admiration.

I dare not venture on more sacred ground; but he who has had the happiness of watching the lives of those who, in passing through the world, escape contamination; who devote their faculties, endowments, and exertions to the promotion of the happiness of others, by making them wiser and better; and who show in all their actions, and feelings, and endurances, that the moral sentiments are developed to the greatest height commensurate with humanity—because they are interpenetrated with, and become assimilated to, the divine light and the divine pattern;—he who has watched the course of such lives and characters will understand what is signified by "the beauty of holiness."

V.

Feelings of an interesting and pleasurable nature, called up by outward objects, or by reproduced images in the mind, have the power of shedding beauty on their sources. It has been held by some who have thought closely and written eloquently on this subject—particularly Mr. Alison and Lord Jeffery—that there is nothing beautiful but what owes this quality to its power of exciting or reproducing emotions

of an agreeable or interesting character, such emotions being naturally or by accident connected with the object termed beautiful. This view excludes all beauty as dependent on form, colour, and sound, and indeed refuses to admit that there is any such thing as essential beauty. I trust that what has been said in the former part of this essay will have been sufficient to prove that there is good reason for considering beauty as having a cause independent of its associated feelings. "If there were nothing," says Dugald Stewart, "origally and intrinsically pleasing or beautiful, the associating principle would have no materials on which it could operate."*

Nevertheless, this secondary beauty is very largely mixed up with the primary; and in many objects it is extremely difficult to separate them. It may be difficult when contemplating a beautiful female face to say how much is due to physical beauty, and how much to the play of expression and of all the interesting emotions and sentiments related with such expression; but we cannot doubt that there is beauty in the finely-proportioned and exquisitely-chiselled contour, in the hue of the delicately-tinted cheeks, the ruby colour of the lips, the brilliancy of the eyes, and the flow of the raven or golden tresses. It is in vain that an eloquent writer tells us that we see in those qualities only the signs of youth, and health, and gaiety—and that such objects would have no attractions for the Negro, the Mongol, the Esquimaux, or the Chippewa. To this we answer, that there are qualities in the ladies of those races which excite in the minds of their adorers the same kind of admiration as that which is produced by such faces as we have faintly sketched. Let the Negro, the Mongol, the Esquimaux, and the Chippewa, admire, to their heart's content, their sable, or yellow, or copper-coloured charmers,—we are Caucasians, and will not be told that there is no beauty in "vermeil-tinctured lips," and in "tresses like the morn," and in

"cheeks as fair
As rose-o'ershadow'd lilies are."

The more familiar objects may be—that is, the longer they have been the objects of our experience—the more difficult is it to separate the accidental or secondary from the primary or essential. View a meadow in Spring, on a sunny day, verdant with grass and full of golden buttercups or cowslips—there is unquestionable beauty in the impression on sense; but the scene is full of other causes of interest –

* Philos. Essays, page 289, 4to. ed.

thoughts of spring, and all that spring implies, whether as a reality or a type—the memories of childhood or youth—all that poets have sung or painters have coloured;—all these associated ideas and emotions crowd into the mind so tumultuously as almost to deprive it of its capability of recognizing the original source of delight in the scene; —the delight which we felt as children when first we saw the meadow, and which would be of the same kind were we in mature age to behold it for the first time—the simple enjoyment of the glory of the green and gold.

Confusion, in regard to this subject, has also been caused by the consideration either of those cases in which there is no primary beauty, or beauty derived through the senses, or of others in which an object beautiful in itself loses its charm or becomes positively unpleasing by reason of the coherent emotions. A colour may in itself have great attractions; but it may be so unfit for the surface to which it is applied that the combined influence of the colour, and the thing coloured, may be absolutely disagreeable. A strain of music, otherwise delightful, may, by recalling some disagreeable or disgusting circumstances with which it was once associated, become a source of actual pain or irritation to the hearer: but the reverse effect is, perhaps, more frequent. It is less common for an outward impression to be robbed of its beauty, than for one not in itself capable of exciting simple beauty to become invested with the beauty derived from the associated interest. Such is the transforming power of affection that the subject of it will say, "You think him plain, but to me he is beautiful!" In such cases the neutral or unpleasing impression is overlooked, or regarded only as a sign of the suggested interest—the symbol being absorbed in the symbolized.

The power of mere pleasure of emotion to invest the outward cause of it with the quality of beauty is strikingly exemplified in the text, "How beautiful on the mountains are the feet of them that bring glad tidings!"

When speaking of variety we glanced at the Beauty of Expression. This kind of beauty belongs, for the most part, to the three divisions which have now passed under survey—the Intellectual, the Moral, and the Emotional. When an object in nature or art raises a feeling of beauty which either cannot be referred to form, or colour, or sound, or any other sensational quality, or in which such sensational beauty is subordinate to that which is not sensational, we say that it has the

beauty of expression. Such beauty as men feel when touched by "the tender grace of a day that is dead" brought suddenly back to the mind by an outward object,—or when visited by forms which live only in the imagination, or which come at the bidding of poets, without being present to the bodily sense,—or when subdued or fascinated by those charms of mind and soul which hover over the brows, beam in the eyes, glance from the cheek, and play about the lips, without the consciousness of the presence of face or feature; such is the beauty which belongs to expression. It is this which makes the seen subordinate to the unseen, by which the soul triumphs over sense, and the ideal supersedes the real. And yet it is not the perfection of beauty; for this is only complete when all its several elements are present in due proportion and co-ordination, and working harmoniously together, —beautiful shapes and sounds with beautiful thoughts and feelings.

Why the production of emotions which seem in themselves to have no pleasurable element should be eagerly desired or accepted—as in tragedies, tales of sorrow, and terror—is a curious question, which we have no time to consider. We must admit it to be a fact that we take pleasure in the excitement of strong emotions, of whatever nature. It is constantly recognized in common experience and common language. We talk of the "love of mere excitement." The stirring of our mental and spiritual nature has a kind of enjoyment like that of the exercise of our muscles. The word *interesting* is often used in a sense very different from *pleasing*. An object or emotion which we like to keep before our minds is interesting. A face may be far from beautiful, and yet it may be very interesting; it may call up emotions connected with sorrow, and suffering, and bereavement,—and yet we have an interest in contemplating it; nevertheless the interest is not long sustained unless there are hints of moral qualities which excite admiration, —such as meekness, patience, and resignation.

In the *sublime* there may be no other emotions called forth than wonder and awe, yet the mind will dwell upon the object which excites them, and anxiously desire a repetition of like emotions. In the contemplation of sublime scenery the soul seems to be endowed for a time with a supernatural expansion and elevation of its nature. It exists in a sphere eminently contrasted with its every-day life, far away from all mean and vulgarizing associations and experiences;—approaching nearer to the Infinite, of which Imagination dreams and which Religion partly unveils. It is, for the time, a newer, wider, and loftier phase of being.

We have seen that the Beautiful results from certain emotions of which visual pleasure is the simplest type. But the feeling of the sublime is not resolvable into mere pleasure of sense. It may be associated with it, but there is something more. The fundamental element is the emotion of wonder tinged with awe. As pleasure and admiration belong to beauty, so wonder, awe, and reverence, belong to the Sublime.

Colour, proportion, symmetry, and variety, we have seen, are constituents of beauty. They have no essential connection with sublimity. Size, quantity, space, are the factors of the Sublime. The eye takes in a great extent of light, travels over vast breadths of shade, rises to altitudes or plunges into depths. The broken line that would jar the sense of beauty may minister to the Sublime—as in a distant mountain-range, where the angular peaks carry the eye upwards and enhance the feeling of elevation. The *curved* line may indeed detract from the Sublime, seeing that it brings the eye downwards, and is, therefore, not suggestive of elevation. Facility, or absence of sense of effort, in one sense belongs to beauty; but the very feeling of effort, and labour, and difficulty, harmonizes with the Sublime.

From all that has been said it would appear that when we experience pleasure from objects of sight or hearing—whether present to our senses or recalled by art, poetry, or eloquence,—or from certain results of mental operations,—or from the contemplation of moral actions,—or from suggested emotions—we apply to that which is the outward cause of that pleasure the epithet Beautiful; and according to the quickness and fineness of our perceptions; or, secondly, the extent of our power of judgment, and reasoning, and imagination; or, thirdly, our sympathy with moral goodness; or, lastly, the liveliness and readiness of association in our emotions; will be the degree of our susceptibility of the Beautiful.

The sensorium is so organized as to respond to the harmonies of sight and sound of the outer world in all men of normal constitution. But the faculty has different degrees of development in different individuals, and is susceptible of almost unlimited cultivation. That, however, which is most calculated to move our wonder and admiration is the mental constitution of men of creative genius, whereby they unconsciously produce such harmonies of sight and sound, and embody them in outward objects.

Very wonderful is it that the proportionate vibrations of the air, and the harmonic ratios of sculptured marble, should give so keen a sense of delight to the ear and the eye; but how much more wonderful that unconsciously in the brain of the man of genius, in the mysterious molecular actions of the ultimate vesicles of the nervous tissue, there should be evolved, without any outward agencies, those ratios of space and time which, working on the nerves and muscles of voice and hand, make themselves heard and seen in far-off lands, and far-off times, filling the world to its remotest bounds with forms of beauty and tones of melody that never die;—miraculously preserved in tombs of Thebes; buried, but disinterred in palaces of Nineveh; lingering among the oleanders of Lycia; shining, though not with "original brightness," on the Acropolis of Athens; and thrilling through the vaults of cathedrals;—requiems of Mozart, demi-gods of Phidias, sibyls of Michael Angelo, Madonnas of Raphael, heavenly cadences of Milton;—all—answerings of the internal great ideas, emanations from those inaccessible cells where the vital force, with an inspiration and energy past man's understanding, plies her mysterious work! Thence issuing, these wonders of form and sound are caught by the eyes and ears of other men, pressed to their hearts, shrined with their gods, mingled with the blessed sanctities of their homes, and handed down to distant ages,—so that the thought and feeling of one mind may become the beauty and the joy of all men for ever.

VI.

Though I am by no means so ambitious as to think of treating this subject exhaustively, a short space must be devoted to Ideal Beauty. On this subject there are many theories. According to some writers, Ideal Beauty is attained to by separating from several individual forms those parts or qualities which are most beautiful, rejecting the imperfections, and compiling, as it were, an aggregate of excellencies. In the opinion of others, Ideal Beauty is nothing but that which is derived from the most perfect specimens of the actual. The perfection of Greek sculpture, according to this view, is to be attributed to the excellence of the models and to the careful imitation of them. A third view is that we realize Ideal Beauty by heightening those qualities in which consists the specific character of the form which is to be represented. Thus, as in the human form, there are many points in

which the types of the inferior animals are departed from ; and as it presents features expressive of the higher and nobler qualities, these departures and expressions are in the ideal form to be more strongly marked than in any that may have been actually submitted to our observation. In all these views there is something of truth ; but they do not afford the required explanations.

And yet the matter seems simple enough. Beauty depends upon the mind. There must be mind to perceive it. To a person wanting the power of perception it is of no use to be told of exquisite colours, or of fine lines, or of harmonious combinations of form, or of the expression of related emotions, &c. If he does not perceive these things, to him the object is not beautiful, and to him there is not even *Actual* Beauty, which is beauty perceived. Now Ideal Beauty in its birth is not that which the mind perceives, but that which it imagines. No one will question that the mind makes combinations very different from anything that has ever been presented to the senses. This imaginative faculty is very unequally developed in different individuals. To its operations in some gifted minds we owe the greatest works of Art and Poetry. The poet, the dramatist, and the novelist, conceive characters infinitely more wise, and brave, and fair, and good, than any beings whom we have met with in actual life. If we have low views of composition we complain of such characters as too heroic, too angelic, too unearthly, forgetting or unaware that art does not consist in the mere imitation of the real and actual, but that it aims at educing and realizing the divine possibilities of our nature. If a person has no imagination, to him there is no ideal beauty ; just as we have seen that to the person wanting the correlative sensibility there is no actual beauty. As is the mind, as is the imagination, as are the ideas, such will be ideal beauty. Raphael writes a letter to his friend telling him that he is designing a Madonna—from a model? No—but from the idea that is floating before his mind. No one who really admires the Madonna di San Sisto will dream that Raphael had ever seen such a face as her's. His mind created it as an idea, and his had realized it on the canvas.

I need scarcely add that in such operations the mind does not act apart from law. Influenced either by intuition or by knowledge it still, in its freest excursions, keeps within harmonic forms and ratios, whether employed in shaping a goddess, or in designing a Madonna, or in planning a temple or a cathedral.

In the successful exercise of Fine Art the qualities of the inner and outer world are interpenetrated. He who draws or moulds only from his own mental conceptions must soon become barren and unfruitful; but he who only copies natural objects as they are presented to his mere bodily sense will never be a great artist. Art is not subordinate to nature. It is inclusive of nature. It is nature *plus* the skill, the power, the sentiment, and the imagination of man's mind. It is nature informed with thought and infused with feeling. It is nature exalted, refined, and glorified. In a word, it is nature impregnated with humanity. Nor let us entertain for one moment the notion that to speak of nature as *humanized* is to speak of it as *lowered;*—as if it became less divine; as if while nature sprang direct from God, man did not; as if whilst all that nature has done and does has been done by the direct impulse of God, man's operations, on the other hand, were entirely apart from those of God, independent, and all but antagonistic. Who made man? Who gave him his cunning hand, and his fine discerning eye, and his "large discourse of reason," and his sense of beauty, and his conceptions of the Ideal Fair and Good, and his faculty of embodying them in the sight of his fellow men? Surely we ought not to disparage the work of this very work of God,—this art-nature,—this nature fashioned, and moulded, and sculptured, and coloured, and arranged, and piled up, and set forth, by the highest nature of all,—the human hand and the human brain, those greatest of God's creations.

Art, I have said, is inclusive of Nature. It is Nature and something more. Nature is substance existing in certain forms and modes and conditions of being, full of forces which are latent or actively at work,—and man is in the midst of them. If he is content with nature as he finds it, he is a dwarfed, undeveloped being. But it is not so; for it is obvious that there ever arises in his mind a dissatisfaction with the world about him. He has capacities of enjoyment which this rude, uninformed nature will not satisfy; his thoughts grow, and nature is compelled to grow in co-ordination with his thoughts. His food must be elaborate and refined into something more sustaining and delicate and enlivening than what he can gather from wild fruits and rivulets. The defences from frost, and wind, and rain, which he has snatched from the lower animals, will not content him; it must be woven and coloured into conformity with his sense of beauty. Mansions and palaces will supersede the hollow tree and rocky cavern. Many a

generation, however, must rise and fall before that stage of development arrives in which the complicated intellectual wants and desires of civilized life are manifested. But in those distant ages it will come to pass that although he will have learnt to appreciate, in a way that his progenitors never dreamed of, the glory and beauty of the visible world, yet these are not enough for him. He must contemplate these objects under other forms ; forms of his own invention, forms that have a fascination of their own ; beauties culled from nature, but arranged into groups fairer and grander than nature can supply. The most beautiful of the daughters, and the stateliest of the sons of men will scarcely satisfy him ; but from his fashioning hand and shaping imagination the marble will grow into diviner forms, and the canvas reflect more heavenly colours. And when he raises buildings for the worship of his Gods, they will be such as have no types, and scarcely a hint in nature, beyond that of the trunk of a tree for a pillar and of a forest-shade for the arching of an aisle. His temples, and towers, and cathedrals, are not borrowed from nature—outward nature—but are given to that nature by the higher nature which is in the mind of man. Let us refrain, then, from a hypocritical laudation of Nature and disparagement of Art. When the flowers of our conservatories are to be plucked in the woods and hedgerows, when a match for the English hunter or racehorse is caught in the prairie, when silk-worms make Cashmere shawls, when the winds chant masses of Mozart, and the birds pipe a pastoral of Beethoven, when we meet a Venus of Melos in the fields, or accost a Delphic Sibyl in the village, then let us begin to talk of Art as the mere reflex of outward nature.

Akin to the question of Ideal Beauty is that of the Standard of beauty. It is like that which concerns the standard of Truth and the standard of Morality. To a certain extent it must vary with the structure, the cultivation, the enlightenment, and the refinement of the mind. But as men are within certain limits so similarly organized or endowed as to be agreed on certain views which make a body of universal truth, on certain principles of action which conform to the idea of virtue, so there are certain laws of composition and design admitted by the best-informed minds, which cannot be violated without departing from the standard of beauty, which is in fact the catholic æsthetic faith established by those who, on account of their endowments and knowledge, have an authority in such matters. The variations of

the standard of intellectual truth are, as might be expected, greater than those of virtue; and the standard of beauty, which is, as it were, supplemental to our life, varies still more than that of truth. Races and ages affect all three; but given the same race, and an equal amount of culture and freedom from traditions, the amount of divergence in the standards will be less observable.

VII.

For all this world of Beauty in Art and Nature there might seem to be a sufficient reason in the happiness resulting from the delighted exercise of man's faculties in perceiving the one and in producing and admiring the other. But there is more than this; for the Fine Arts may be useful, in the same sense as the more expressly Useful Arts, by aiding the accomplishment of some particular purpose.

Thus in portraits, busts, and statues, they may preserve the features and forms of men who had won the admiration or love of their friends and contemporaries, and may at the same time represent the feelings of the latter; or in frescoes, and bassi relievi, they may commemorate great events and actions which have determined the fates of heroes or of nations. In the performance of such functions Art is a sort of durable embodied visual language, telling in representative forms what otherwise would have needed oral or literal communication. And in this ministration it may or may not at the same time give that pleasure which is purely artistic or æsthetical, just as facts may be told in words that are either eloquent or simply exponent. But it rarely happens that works of art are required for the bare purpose of representation or commemoration. They have generally been expected to add dignity to the subject. The portrait and the historic painting, the statute and the basso relievo, must represent their subjects so that ideas of beauty and sublimity shall at the same time enter the mind, as when it is under the corresponding influence of eloquence and poetry. And this is decoration in its largest sense. Only those men and those achievements are commemorated which we hold in veneration or affection. Art in representing them must excite associations worthy of them—impressions of beauty and grandeur.

The conjunction of the Beautiful with whatever is of worth,

honour, dignity, or even of value, in our daily life, is evidenced in the works, manners, and customs of mankind. The splendours of dress, the shaping of instruments and utensils, the decorations of houses, of public buildings, of temples and churches, all give testimony to our instinctive association of the Beautiful with whatever we approve, value, admire, or venerate. The mere finishing of a common work of handicraft with such neatness and polish as are agreeable to the eye, and therefore impart a kind of beauty to the object, does homage to this principle. In obedience to it mankind array themselves in their best apparel at their feasts and solemnities; and they require that buildings for the transaction of any important affairs shall be something more than mere shelters from the elements, or screens from intrusion. And there is a reciprocal action from the objects. The beautiful forms and colours which were originated to satisfy the mind, when wishing to express its veneration or admiration for some person or object, will, by the inevitable force of association, recall the object with its correlative emotions.

This principle is well illustrated in buildings devoted to certain public objects. Thus it is held suitable that when governing authorities hold their councils for the good of the community they should be assembled in buildings the structure and decoration of which are such as to excite feelings of admiration or respect. If it be a building occupied by the highest powers of a great nation, it is hardly possible to erect an edifice commensurate with the wishes or expectations of the people. The mere accommodation of senators in rooms well lighted, airy, and of pleasant temperature, would be far below what satisfies a great nation. There must be spacious antechambers, lobbies, grand corridors, lofty domes, and enormous towers, which have nothing to do with convenience, but which are thought fitting, and are eagerly demanded and cheerfully paid for, because they answer to those feelings of awe, and admiration, and attachment, which are associated in patriotic minds with anything so august as the assembled wisdom and concentrated government of the country.

But still more striking is the operation of this law of our being in the buildings which are consecrated to religion. Whatever form the religious feelings and ideas have assumed, and in connection with whatever faith, whether sprung from the simple natural intuitions of the race, and blended with the fictions of poets, or informed with the reflections of philosophers, or whether they have been raised, refined,

and purified by the teachings of direct Revelation, they severally require (with one singular exception) that the services of their worship, the ceremonies which symbolize the supernatural parts of their religion, the declarations of belief in their solemn verities, the chanting of their hymns of praise, the oblation of their litanies, the intercessions of priests, the eloquent exhortations of ministers,—whatever is uttered, whatever performed in public manifestation of the religious sentiment,—must require a building which shall be specially set apart for the purpose, and which in its structure, its arrangements, and its ornaments, shall answer to and harmonize with the greatest and holiest feelings and conceptions of which our nature is susceptible. Here ought to arise in our minds the highest awe and wonder, the purest admiration and love; and everything around us should correspond with those emotions. The light should by its dimness be fitted to suggest to the worshipper that he has passed from the common light of day and his worldly transactions; yet it should be tempered and softened with those hues which give solemnity and tenderness to the feelings;—the various members of the building should minister to the sense of grandeur; pillars, for example, by their massiveness as parts, giving hints of the greatness of the whole; and there should be intimations of spaciousness and elevation as the eye wanders through vistas of arches, or is invited by beautiful shafts to look upwards and heavenwards. And if my readers have gone with me in what I have ventured to propound, in connection with the symmetric laws of nature, they will admit that the harmonic combinations of art in sight and sound may tend to place the mind in an attitude fit for the reception of the highest truths, and attune it to a sympathy with the most hallowed feelings.

Now I am not presuming here to say whether these natural tendencies of the mind to seek such æsthetical aids to the religious feelings ought to have free scope, or whether they ought to be repressed. About this the wise, the learned, and the pious, have differed greatly, either because of the diversity of their theological doctrines, or because of the great difference in the degrees of development or culture which the æsthetical element has attained in their respective minds. On the one side it has been held that human nature is so apt to turn away from devotional feelings, or so ready to change them for mere worldly emotions, that it is impossible to multiply to excess those influences which tend to maintain them; and that, with

the majority of mankind, reason, and conscience, and faith, and duty will not avail, unless assisted by sense and imagination; and that even in the apparently simplest forms of worship, where ceremonial pomp and sacerdotal functions are most repudiated, it will be found that the excitement of the psalmody, and of the burning words of pulpit orators, kindling the fancy and imagination, and stirring up the tragic or pathetic emotions, have an effect analogous to that which is condemned in the more æsthetical modes of worship; but, on the other hand, it is urged that what are called helps by sense are, indeed, hindrances to the devotional feelings, and that the mind, instead of rising above the earth to the higher and holier contemplations, is detained there by the seductions of human art under a false guise—that it is not when the eyes are feasting on delightful colours and beautiful forms, and when the ears are charmed by melody—it is not then that the still small voice of conscience can be best listened to, or a careful review be taken of our thoughts and actions, or the reasonings and precepts of religious teachers be best followed or enforced. It is not for me to say how far such advocacy may err on either side. I am only endeavouring to examine the philosophy of the subject. But I cannot but think that there is a natural affinity between the Beautiful, and the Good, and the Holy. It is but too true that these elements may exist separately,—for as there may be a dreamy unproductive theopathy, or superstition devoid of morality;—and as there may be a hard cold virtue unwarned and unsoftened by devotion, so there may be a sense of beauty without either virtue or religion. It is painful to think of the evil deeds which have been planned and perpetrated in the presence of a beauty thus profaned. In the remains of some ancient cities we have but too many proofs, even now, how little the loveliness of nature, or of the forms and colours of art, availed to prevent the inhabitants from indulging in the grossest vices. But beauty alone will not even avert the still more hideous deeds of cruelty. If the amphitheatres of Rome, where gladiators fought, and lions and tigers sprang on martyrs, if the cathedral towers of Germany, Belgium, and Normandy, and the arches of our ancient colleges, once reddened by the flames of penal fires, nay, if the "Alpine mountains cold," and the lovely banks of the Loire, could tell all that had been done in pollution of their grandeur and beauty, it would seem but too plain that there have been times when virtue, love, and pity received but little assistance

from the Sublime and the Beautiful. If men are depraved and habituated to vice, no gentle motive will check them: but when inclined to virtue, they are very susceptible of auxiliary influences (and virtue needs to be helped); and it is in such cases that beauty, and religion, and virtue seem to uphold and strengthen each other.

But as it is difficult to measure the influence of admonitions which at the time of their utterance seem ineffectual, of the voice of loving persuasion to which deaf ears may for a time be turned, of reproofs of conscience which may for a time be hushed, yet as we know that in other hours they may come back with all the melting or appalling force of pathos and remorse, even so may return the shapes of beauty once associated in the mind with all that is virtuous and venerable. The melody of the psalm which tuned some of his earliest lessons in virtue and religion may yet some day touch the heart of a hardened criminal. And who knows but that the half-penitence of rough freebooters of the olden times may have perhaps been aided by like influences when they lay on some distant shore languishing with fever, or smarting with wounds;—who knows but that among the shapes and signs beckoning them back to goodness, not the least admonitory or persuasive may have been the image in the mental eye of some holy pile, surrounded with memories of innocent youth, and sacred counsel, and the love of friends and kindred!

Should it be thought, however, that we are somewhat straining the function of beauty, in making it the upholder of the moral sense and the helpmate of religion, yet it will not be denied that it may be one, and not an uninfluential one, of the many motives which finally determine action. To a character hovering over the line which marks off good from evil, swayed to this side by temptations and seductions, to that by conscience and duty, the sense of what is *fair* as well as *good* may afford the preponderating motive.

But, not to press this view, there are actions and emotions which do not belong to the merely virtuous, and the merely just and benevolent, but which take their tone and colour from the sense of the Beautiful. Heroic deeds, the graces of life, the refinements of feeling, and all that is understood by such terms as nobility of soul and elevation of character, are more or less allied in their nature, their origin, and their operations, to that sentiment which we have been engaged in considering. Think for one moment what the world would be without it. Goodness, love, worship, would remain. Without

these, indeed, it would be utter darkness and devildom. But where is the charm of life? Where are the flowers of the world, where the hues of rising and setting suns, and where the nightly splendours? Where are the spells of melody, where the fascination of eloquence, the inspirations of poetry, the colours of romance, the revelations of art? Gone; and with the loss of all that glory, and grandeur, and beauty, it must, as human hearts and minds are usually constituted,—it must be more difficult to be good, and loving, and holy. The old Greeks held the good and the fair in one word, *καλόν*: and thus sang one of them (Theognis) more than 500 years before our era:—

"Muses and Graces, daughters of high Jove,
When erst ye left your glorious seats above,
To bless the bridal of that wondrous pair,
Cadmus and Harmonia fair,
Your voices pealed a divine air:
'What is good and fair
Shall ever be our care.'
Thus the burthen of it rang:
'That shall not be our care,
Which is not good and fair.'
Such were the words your lips immortal sang."

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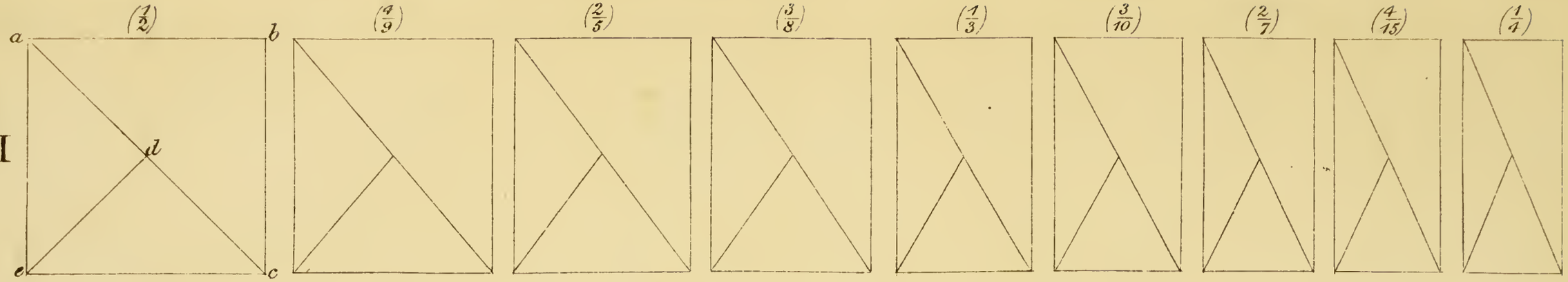
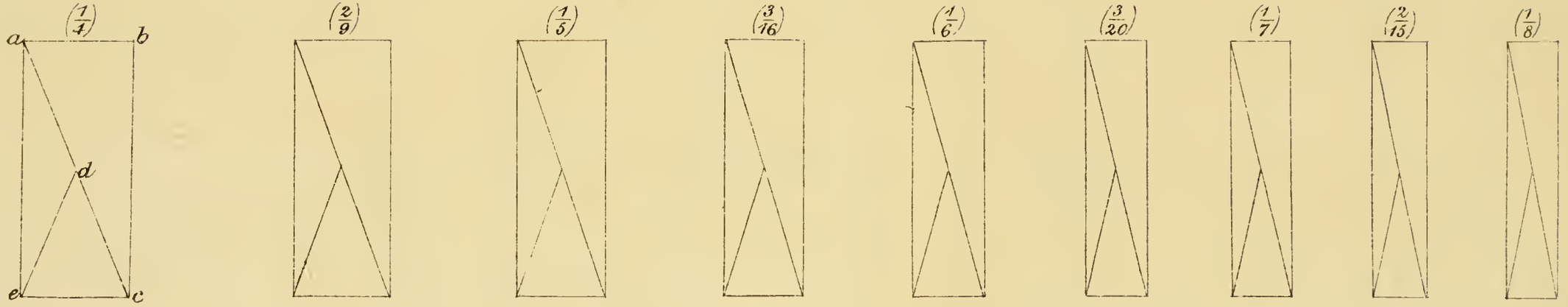
II



III



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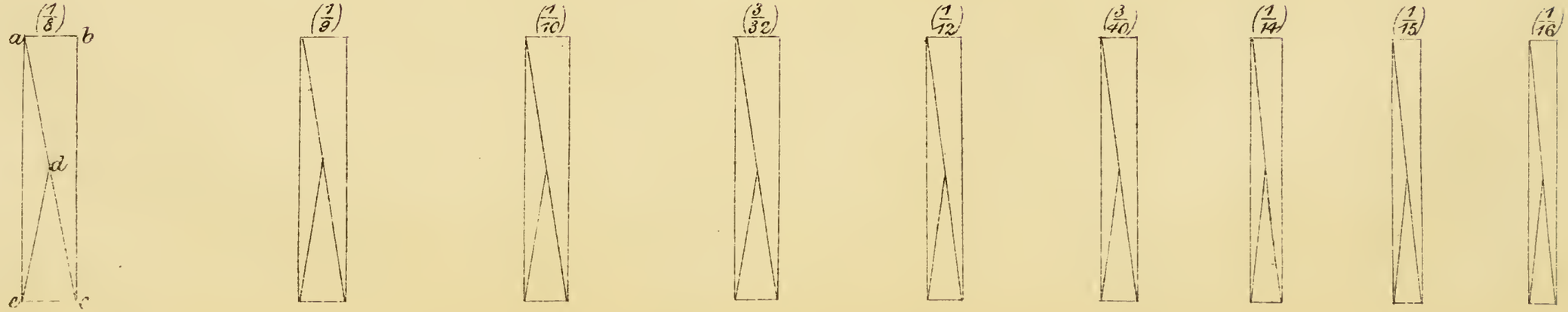

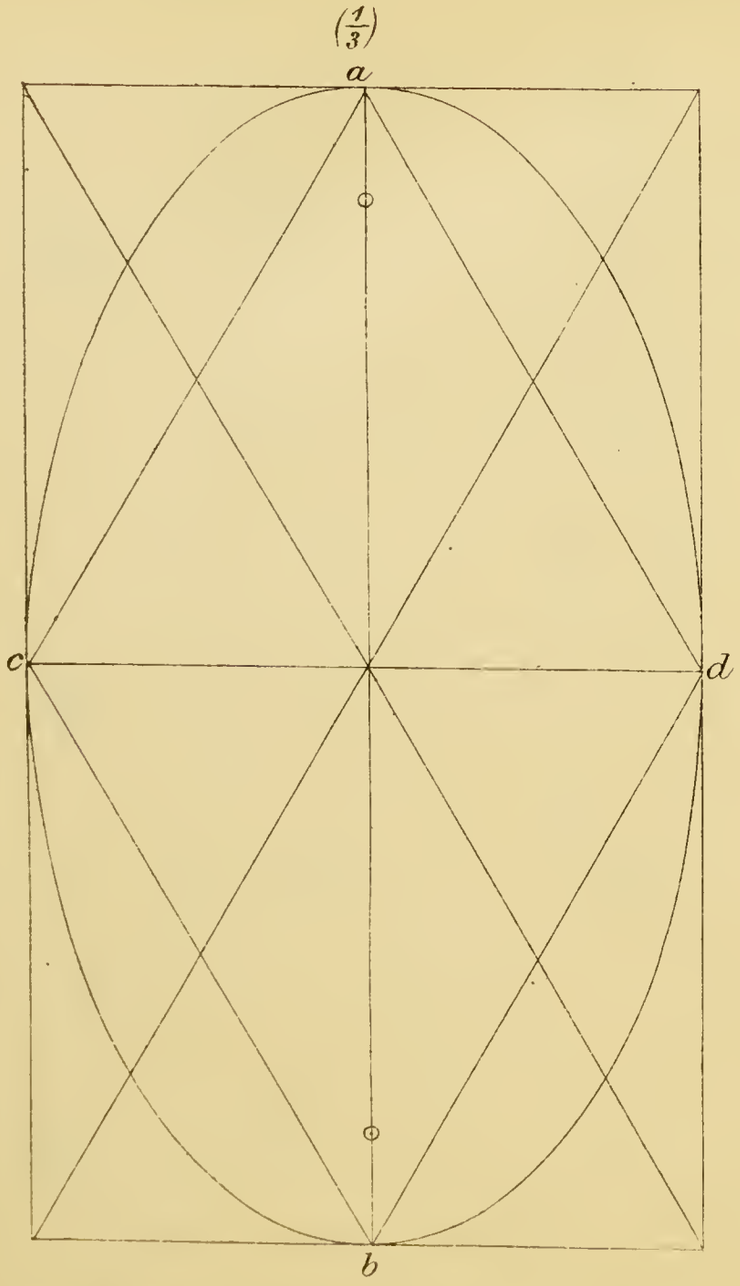
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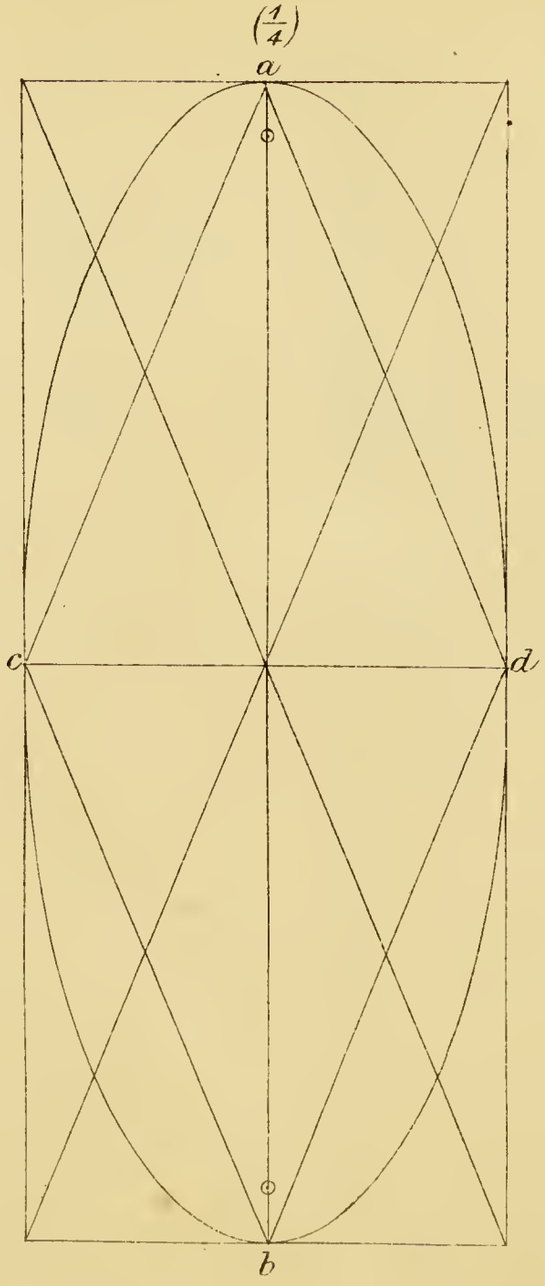
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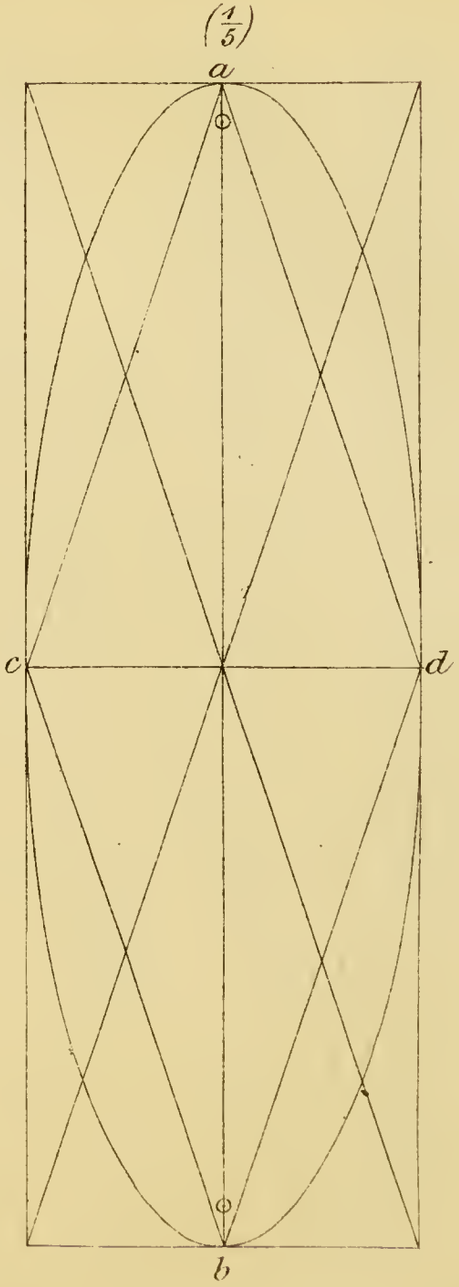
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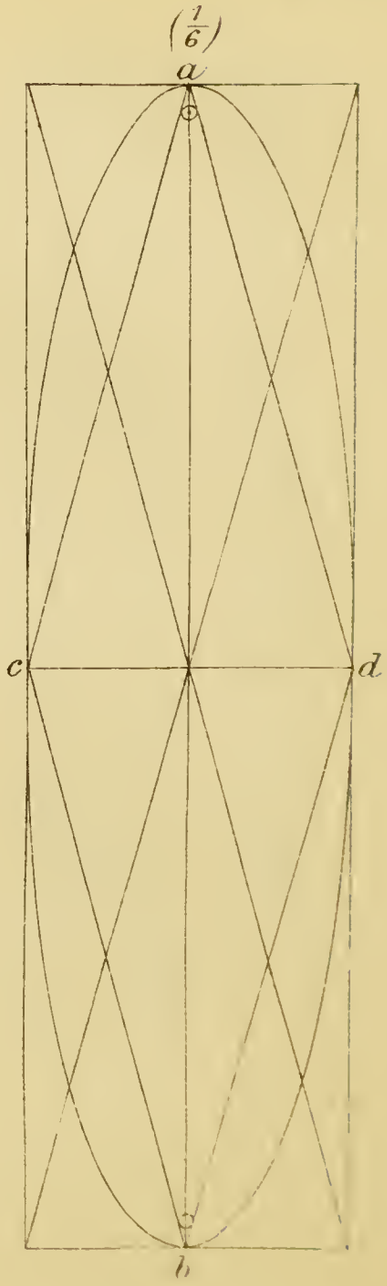
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Fig. 1

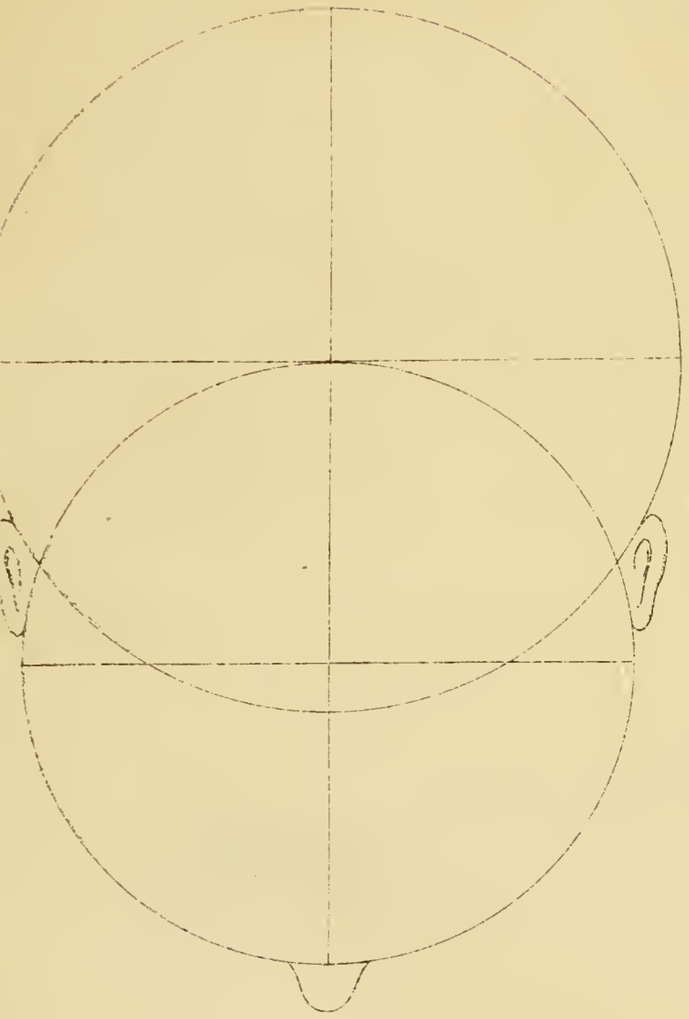


Fig. 2

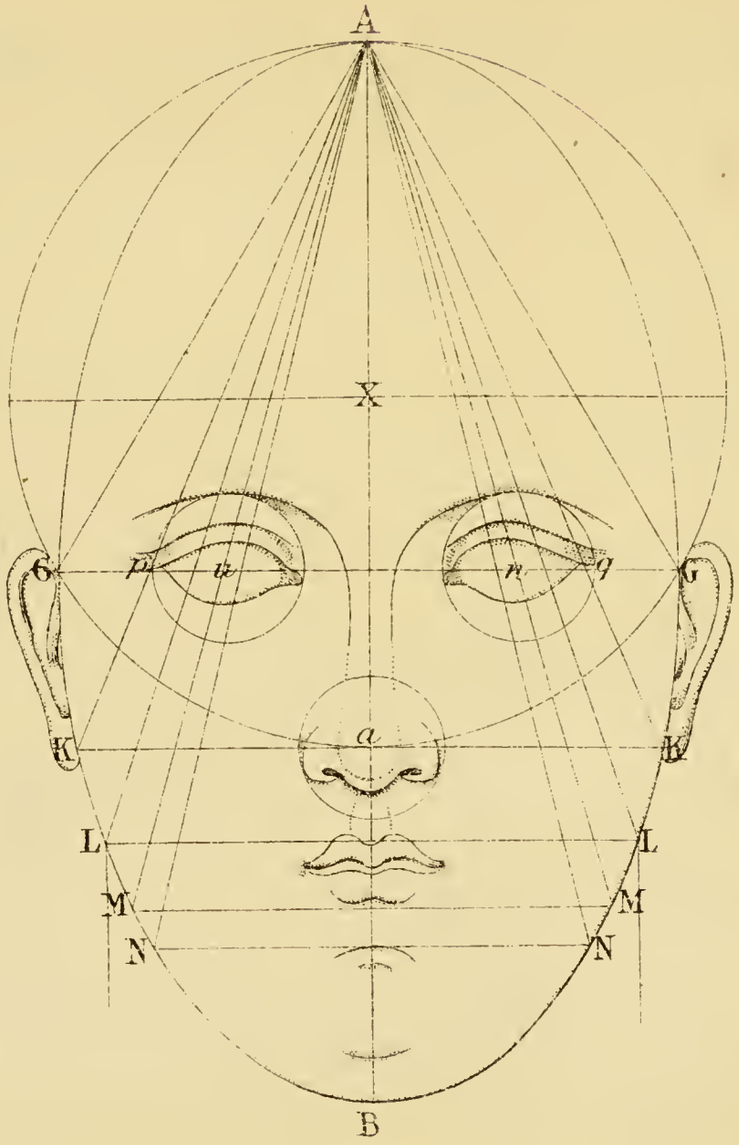


Fig. 3

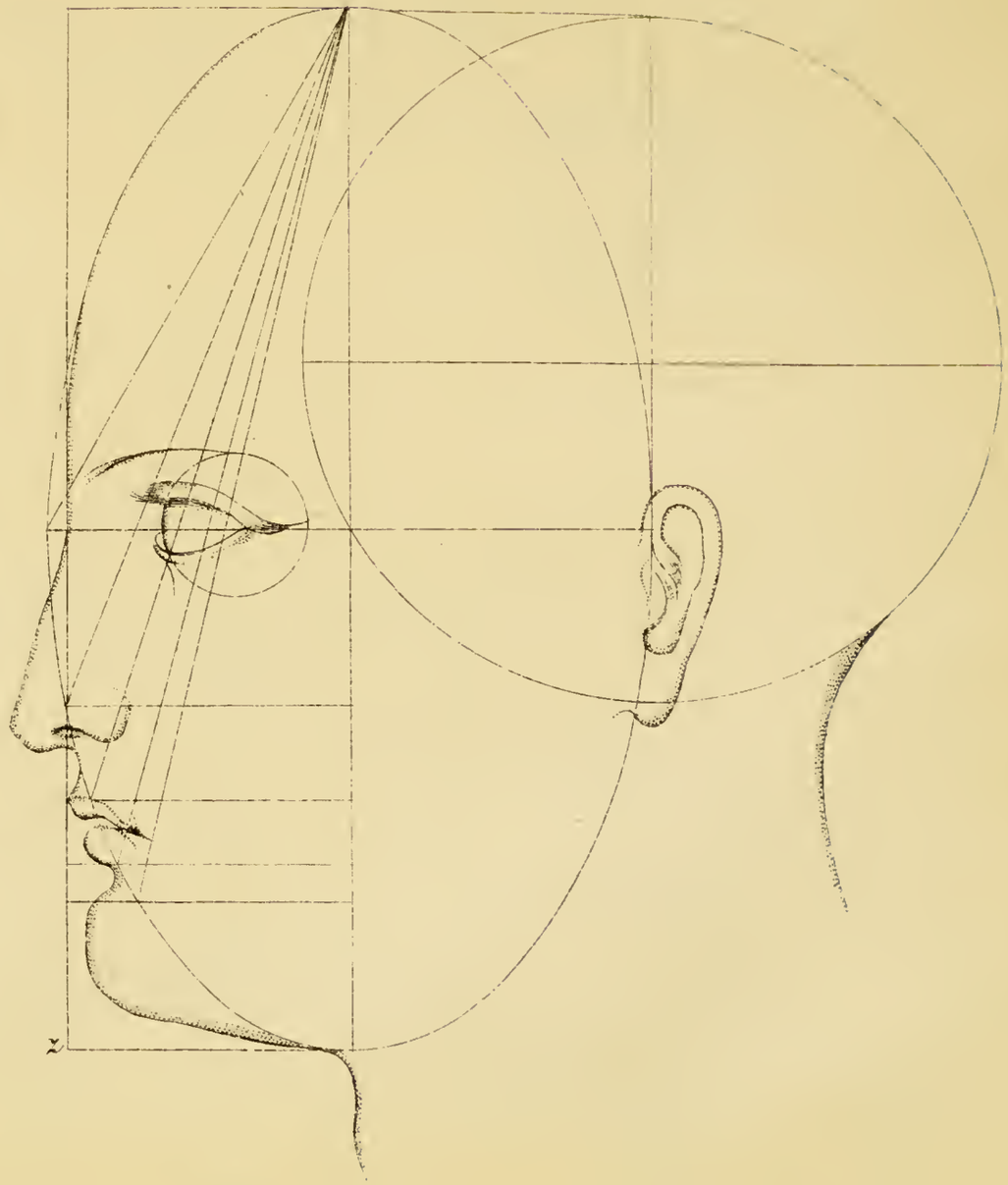


Fig 1

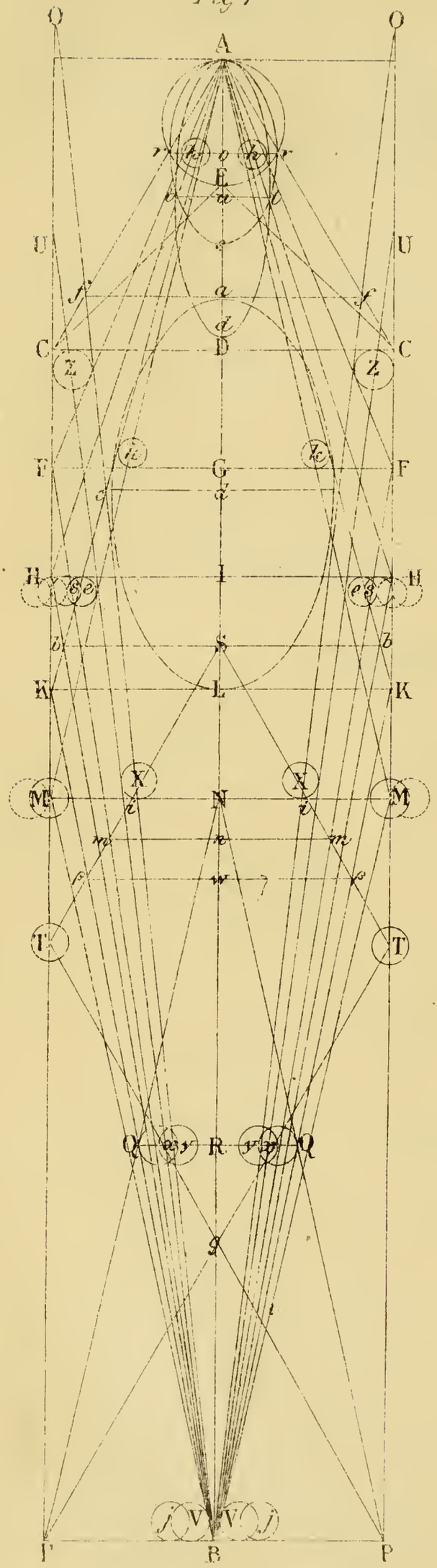
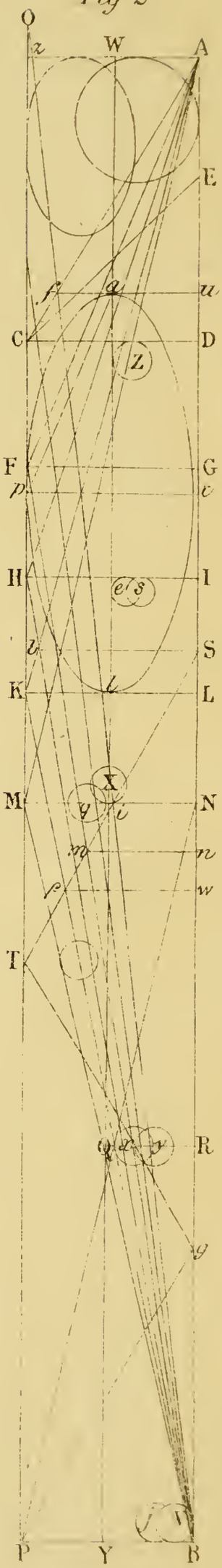


Fig 2



DR Hay del.

Pl.

Fig. 1.

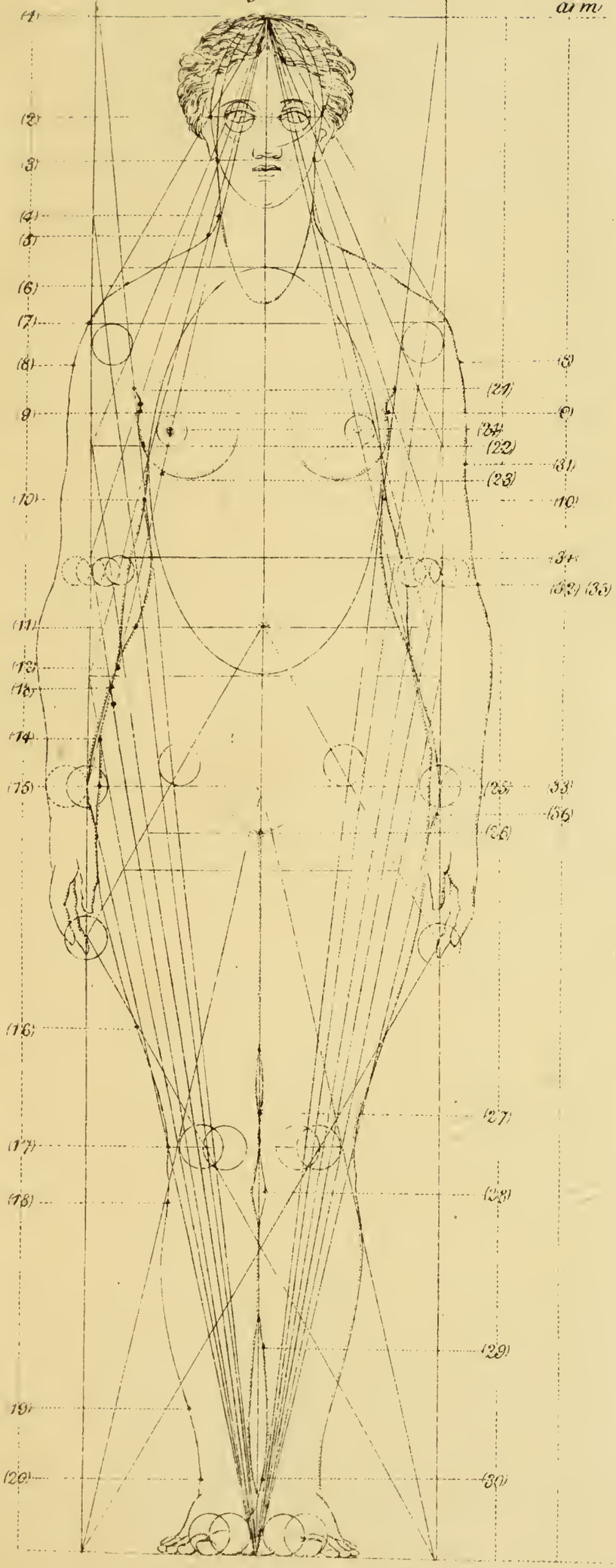
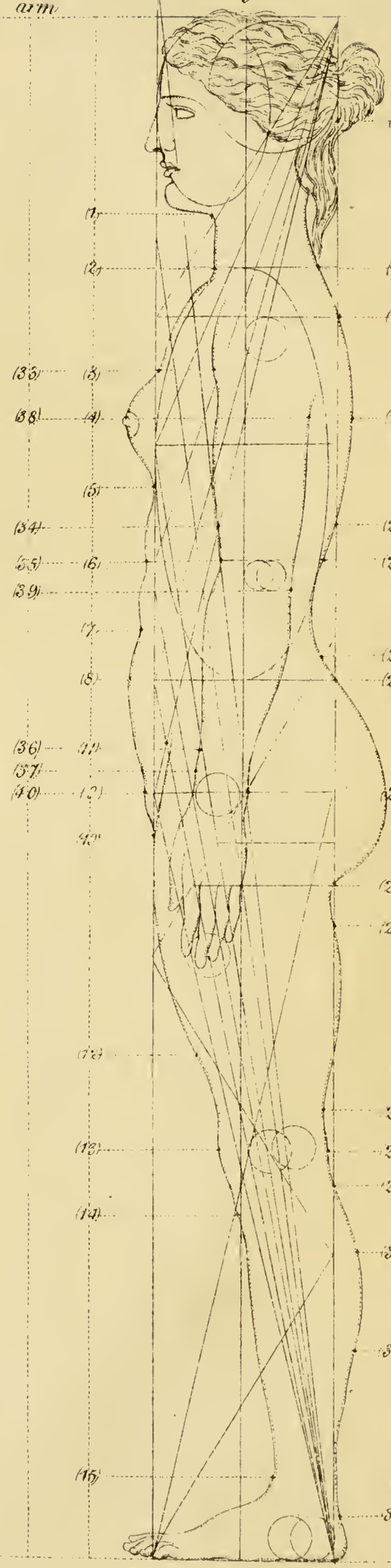


Fig. 2.



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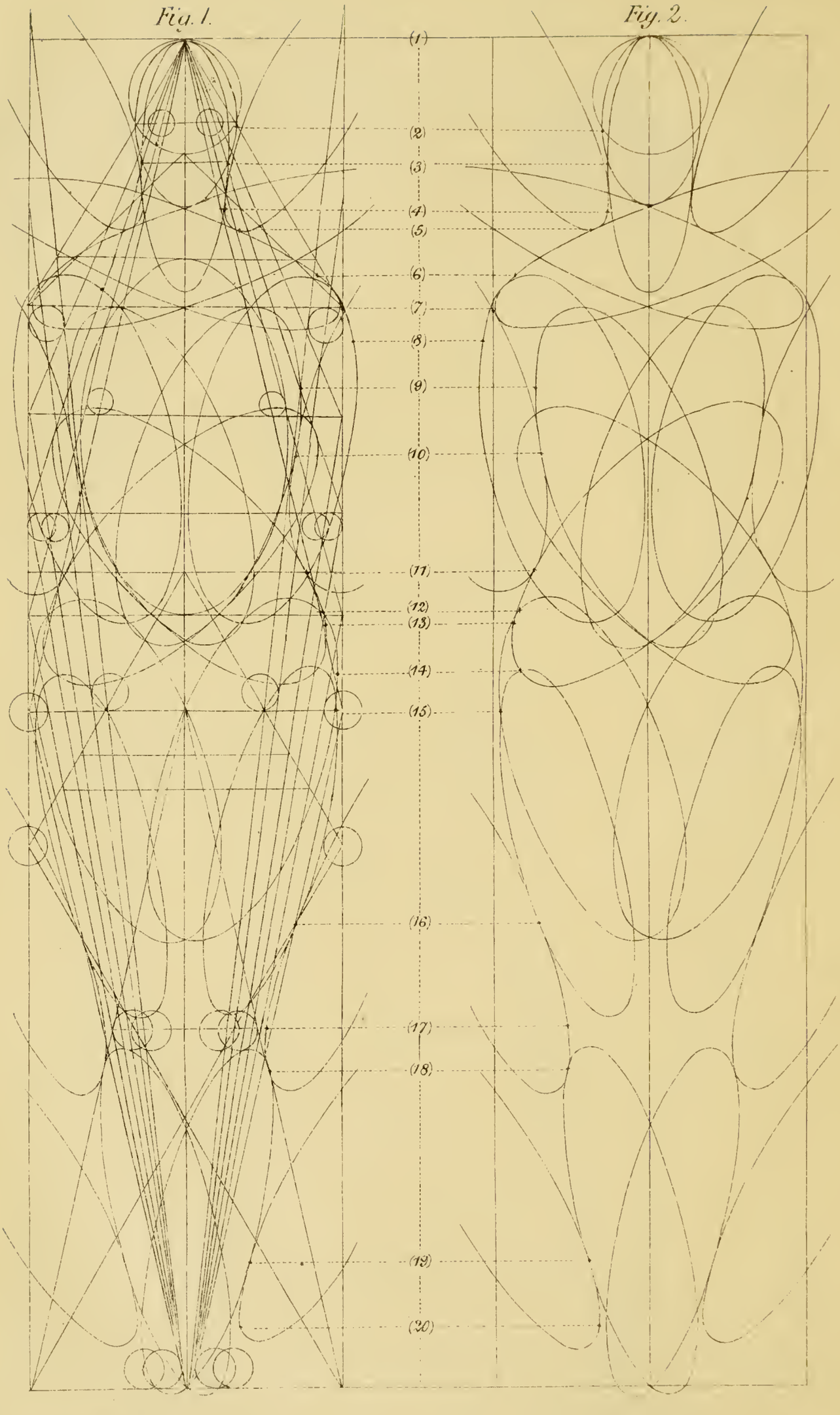

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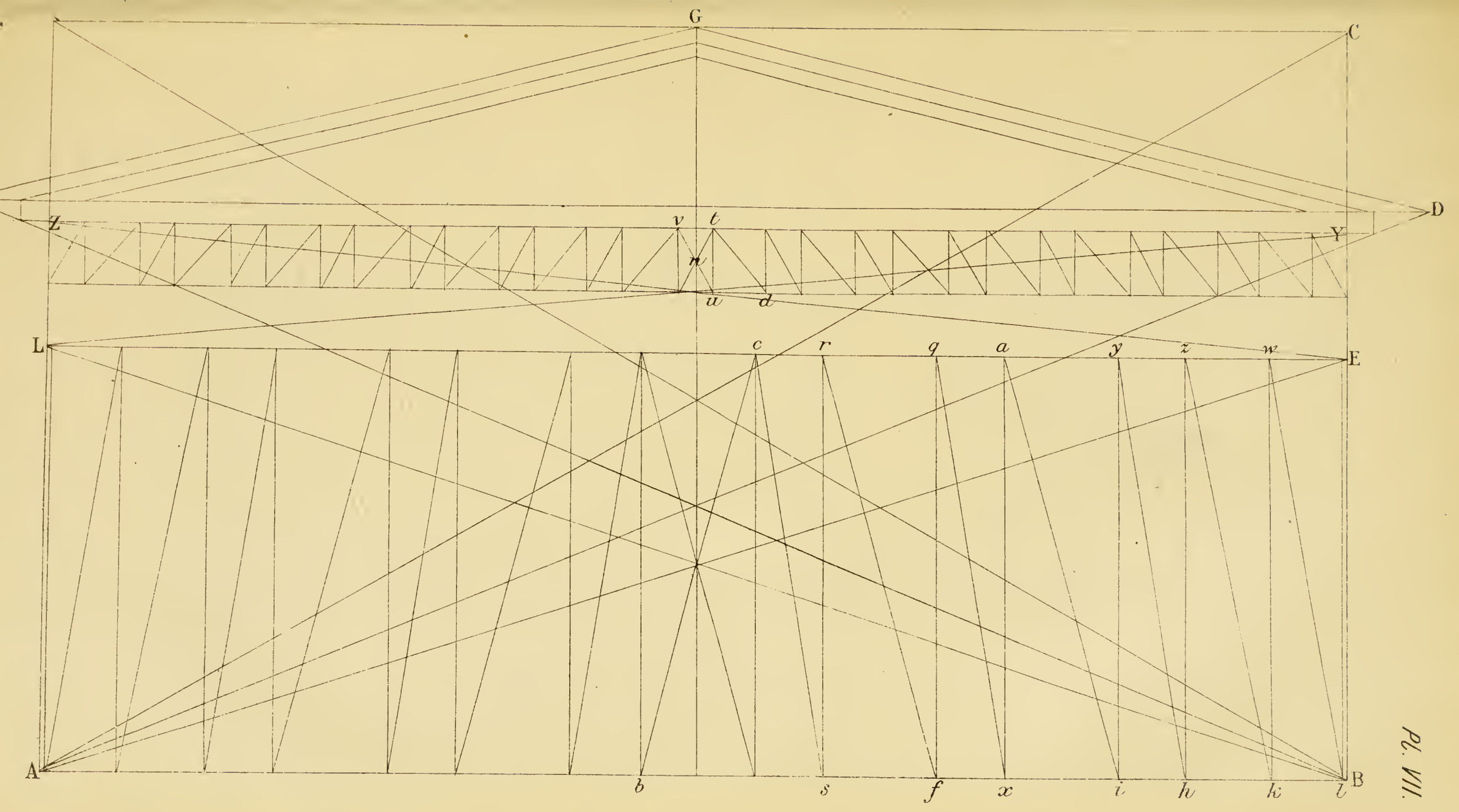
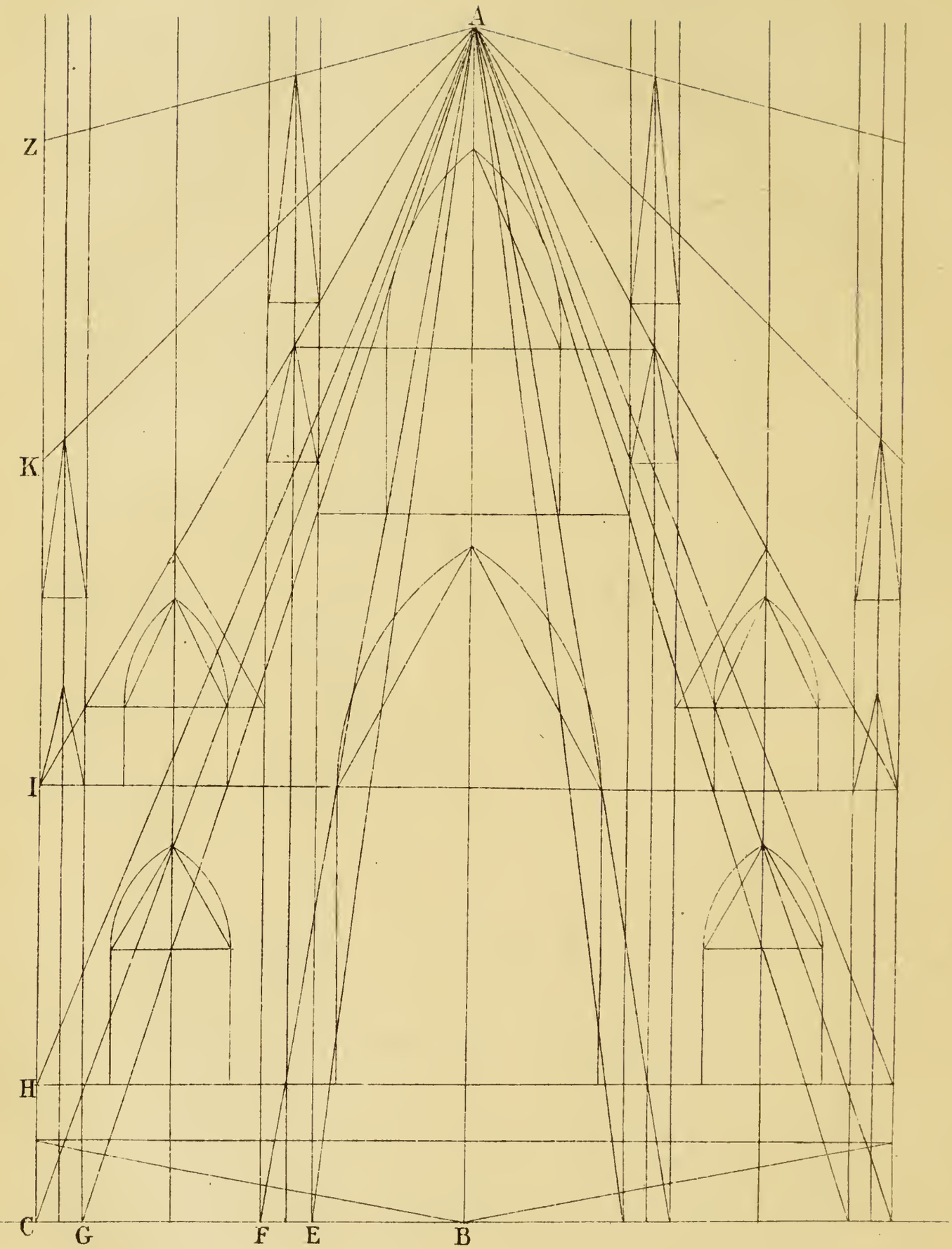


Pl. VII.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WASTE.

A Lecture delivered at the Bristol Institution, February 10, 1863.

TO the student of Final Causes there are no facts in nature that on a first view present more difficulties than those which belong to decay and destruction. Fertile lands in a very few hours overspread by a desolating inroad of the sea, on the retreat of which, if ever it does withdraw, there is left for a time a sandy, stony desert; plants of exquisite organisation springing above the soil and dying undeveloped; forests and prairies consumed by fire; myriads of animals, multitudes of human beings perishing in full life and strength: these and many like facts are at first sight startling. The mighty, ever-teeming mother Earth—is she thwarted by some malignant power in her schemes of beneficence? or, by some blind law of productiveness, does she go on for ever throwing off her wonderful progeny, careless, when they have left her bosom, whether they live or die, or what ultimate destiny awaits them?

But we will not now ask questions. Let us survey in detail a few of the phenomena of waste, and either when they are under our eyes, or when we are recalling them, some obvious enquiries will suggest themselves.

Among the fragile forms of the animated world around us, one is so used to the sight of destruction, that the questions alluded to are almost less likely to arise than when, by some accidental circumstance, we become aware of decay among objects which had seemed to be fixed and enduring. I shall not easily forget the impression made upon me one day, when I stood for the first time in a scene of savage

grandeur, which is, I dare say, well known to many of this audience —the upper region of the Mer de Glace. It was the early morning ; some golden light had just begun to shoot into the deep indigo of the sky above the mountains in the east; and while I was endeavouring to grasp the more salient points of that wonderful scene, fearing lest some essential element of its sublimity might be overlooked, my attention was caught by sounds of crashing, unlike the solemn peals with which distant avalanches announce their descent, and I asked the guide what was the cause of those sounds. He told me, with the indifference of a person to whom that which I enquired about was a matter of daily routine, that it was only the breaking and falling down of masses of rock in the mountains. And there, assuredly, as I looked up towards the rugged peak of the Charmoz, and observed attentively the different slopes, I could see masses of stone continually tumbling down ; —small enough in the distance, but quite discernible ;—and every few seconds or so, the sound was repeated. Now the obvious thought that arose was,—if those sounds, or, rather, the causes of them, were always going on, was not that mountain falling away piecemeal, and destined to leave its giant limbs in the valleys, which would, in time, be no longer valleys, but plains ? The peaks and the ridges looked so broken and jagged and splintery against the sky, that, with that sound constantly in one's ears, it was difficult to avoid expecting that they might snap off before our eyes ;—forgetful for a moment of the vast dimensions of what looked like needles and sword-blades. I know not whether those peaks and ridges have really had any of their lines and angles altered since they were first accurately observed ; but we may be certain that, whether their chief features have changed or not within the records of human generations, those everlasting hills are everlasting only to the bodily eye of man, that cannot see changes on so large a scale, and that they are surely wasting and crumbling to decay.

But any one who has observed the *moraine* of a glacier might interpose,—Surely it is not necessary to strain the eyes to the mountains themselves, when, immediately at their feet, proofs of destruction or disintegration are visible in blocks of granite, some of immense size, either still resting on the ice, or left on the sides of the ice-river along which the glacier once descended, but from which it has of late years withdrawn,—leaving, however, these proofs of its gigantic powers both of support and of conveyance.

Striking as is this work of demolition in stupendous masses of the earth's substance, there is not less sure a work of destruction effected, though in a somewhat less imposing way, by rivers that are perpetually wearing down the surfaces which they traverse, and carrying the results of their attrition to the plains below. Rain-falls even have their effects, and sometimes on a large scale, as when by sudden condensation of great masses of vapour the mountain torrents are enormously swollen. Such rocks as the stratified horizontal sandstone may in this manner be reduced to sand and gravel by the flooded streams. Sir C. Lyell, describing the action of such rain-falls on the south face of the Khasia, or Garrow Mountains in Eastern Bengal, says "so great is the superficial waste or denudation, that what would otherwise be a rich and luxuriantly wooded region is converted into a wild and barren moorland."

Mr. Jukes, in an opening address before the Geological Section of the British Association at Cambridge (1862), when speaking of the wearing down force exerted by rains, gave as an instance the loss of altitude sustained by the great limestone range of the south of Ireland, a loss computed to be as much as from 300 to 400 feet.

The waste of land in landslips is too well known for us to dwell upon it, as well as the corroding effect of the sea on shores. In certain situations on the eastern and southern coasts of our own island, the signs of such destruction are but too obvious. When the shores consist of brittle, crumbling substances, as in the tertiary strata, such effects do not surprise one. But the harder and more resistant rocks are not safe from the devastations of the ocean. On the northern coasts of Great Britain may be seen some very striking remains of rocks that would *a priori* have seemed invulnerable. Granite, gneiss, mica-slate, serpentine, greenstone, porphyry, stand in broken masses, with rent and angular forms, that attest in a wild picturesque manner the terrible battering to which they have been subjected by the violence of the Atlantic waves urged on by westerly gales. In some parts the inroads of the sea are made comparatively easy by the decomposition of soft granite. When the waves have once had access by such means, they are not slow to improve their opportunity, and they widen the breach by rude mechanical force. But even without this preliminary sapping, the sea will battle against a rampart of porphyry, "with all the force of great artillery," says Dr. Hibbert, till it has forced an entrance.*

* See Lyell's "Elements of Geology," p. 300.

The wasting power of water is exhibited in one part of Europe in forms most strange and fantastic. In Saxon Switzerland, as it is called, or rather miscalled, you look down from a wooded height into a valley filled with rocks, which, to the dullest imagination, call up the images of castles, pillars, obelisks, broken colonnades, rude sculptured tombs, and every species of ruin or rough-hewn work in stone that the eye may have ever seen. These singular forms are the remnants of basaltic rocks, which have in geologic periods been rudely dealt with by waters, eaten into, worn down, battered and broken.

The desolations from igneous forces, whether let loose on the surface of the earth from the fiery mouths of volcanoes, or pent up in the interior, and made manifest in earthquakes, belong to the veriest commonplace of devastation, and need only this passing allusion.

The waste of organic forms and of their life is exemplified in that group of phenomena, which Mr. Darwin has so well described as resulting from the struggle for existence. "We behold the face of nature," he says, "bright with gladness, and we often see superabundance of food; we do not see, or we forget, that the birds which are idly singing round us mostly live on insects or seeds, and are thus constantly destroying life; or we forget how largely these songsters, or their eggs, or their nestlings, are destroyed by birds and beasts of prey." He tells us how seedlings are destroyed in vast numbers by various enemies; for once on a small piece of ground he found that out of 357 seedlings no less than 295 were destroyed. The more vigorous plants destroyed the weaker ones, even when fully grown; "thus out of twenty species growing on a little plot of turf (three feet by four), nine perished from the other species being allowed to grow up freely."

Destruction on a large scale is effected by predatory animals. It has been calculated that were sportsmen to remain idle for a season there would be no increase of game, unless the gamekeepers were constantly on the watch to destroy vermin. Inclemencies of season work great havoc; sometimes directly, by cutting off a supply of food, but still more so indirectly, by increasing the competition with other species. How vegetable growths may be kept down and seem to disappear under the destruction of animals, is strikingly shown by the effects of enclosure. I remember noticing many years ago in the Highlands of Scotland, at Pitlochry, near the pass of Killicrankie, that though the profusion of birch trees in some situations indicated

that they were indigenous, yet the partiality of their distribution seemed opposed to the idea, for they were wanting on large tracts that appeared to present the same soil, the same substrata, and the same qualities of atmosphere. It was explained to me by my friend Professor Forbes that the differences depended on enclosure, and that it would be only necessary to fence in a piece of ground so as to prevent the access of cattle, and birches would shew themselves in abundance. When Mr. Darwin's book came into my hands, I was interested in finding that this naturalist had made a like observation as to fir trees.*

Very extensive destruction is sometimes brought on the vegetable world by accidents, or by the carelessness of man. Thus, one has read of grass-land on fire over miles of plain, and of vast forests laid waste in the same manner; the combustion having arisen from neglect in extinguishing a fire that had been used by some wandering tribe or party of travellers.

Animals are extinguished on a large scale by human agency. "That the extinction of many of the existing races of animals must soon take place," says Dr. Mantell, "from the immense destruction occasioned by man, cannot admit of doubt. In those which supply fur, a remarkable proof of this inference is cited in a late number of 'The American Journal of Science.' Immediately after South Georgia was explored by Captain Cook, 1771, the Americans commenced carrying seal skins from thence to China, where they obtained most exorbitant prices. *One million two hundred thousand skins* have been taken from that island alone since that period; and nearly an equal number from the Island of Desolation! The number of the fur seals killed in the South Shetland Isles (s. lat. 63°), in 1821 and 1822, amounted to three hundred and twenty thousand. This valuable animal is now almost extinct in all these islands. From the most authentic statements it appears certain that the fur trade must henceforward decline, since the advanced state of Geographical Science shows that no new countries remain to be explored. In North America the animals are slowly decreasing, from the persevering efforts and the indiscriminate slaughter practised by the hunters, and by the appropriation to the use of man of those forests and rivers which have once afforded them food and protection."†

* "Origin of Species," p. 71.

† Dr. Mantell's "Wonders of Geology," vol. i., p. 104.

But all instances of destruction of vegetable and animal life on the present surface of the earth are as nothing compared with the evidences presented in older strata. It would be incredible, had we not unequivocal proof given to the senses, that there had been such extensive destruction of vegetable forms as the coal measures reveal: the coal itself being, as you know, the product of the decomposition of coniferous plants. As to animal life, it is enough to think of the extensive coral reefs and islands built up by animals; and of mountains nearly composed of the debris of animals, as in the oölite which runs through a great part of Europe, and of the enormous collection of encrinitic remains in the mountain-limestone.

And almost everywhere we find the debris of living forms scattered, or densely packed in their stony beds, to a degree that makes the earth seem a great collection of catacombs—a vast necropolis. It is by a strong effort of the imagination that we conceive those strata to have been once scenes of beauty and verdure and luxuriance, shadowed by stately palms, and populous with animal tribes; and it is rather a painful effort to reflect on the ruin and desolation and destruction that overtook creatures into which God had breathed the breath of life, however little else there may have been in these beings to excite our sympathy. In our own experience we see only the destruction of individuals, however numerous, the species still remaining; but the palæontologist discovers that in the worlds under his survey Nature was scarcely more conservative of species than of individuals.

> So careful of the type! but no,
> From scarped cliff and quarried stone
> She cries—"A thousand types are gone!
> I care for nothing; all shall go."

And how has man been wasted! I will not here say how he has been wasted by himself,—by his own folly and wickedness; nor how he has been wasted by his fellow-man,—by greed and recklessness and oppression and cruelty. But he has seemed to be wasted by the elements,—by agencies over which human will and human thought could have no control; starved by the failure of crops, poisoned in marshes and jungles, swept away by floods, swallowed up by earthquakes, consumed by the lava, or choked and buried in the ashes of volcanoes, drowned in angry or perfidious seas, and, above all, smitten by those unseen angels of death whose wings are spread on mysterious pestilences.

As to the scale on which human beings have perished from the last-named cause, we may instance the devastation of the Black Plague, in the fourteenth century. Here are one or two items taken from Hecker's "Epidemics of the Middle Ages," p. 23 :—

In Florence, died of the Black Plague	60,000
" Venice	100,000
" Marseilles, in one month	16,000
" Sienna	70,000
" Paris	50,000
" St. Denys	14,000
" Avignon	60,000
" Strasburg	16,000
" Lübeck	9,000
" Basle	14,000
" Erfurt, at least	16,000
" Weimar	5,000
" Limburg	2,500
" London, at least	100,000
" Norwich	51,100
To which may be added—	
Franciscan Friars in Germany	124,434
Minorites in Italy	30,000

In many places in France not more than two out of twenty of the inhabitants were left alive, and the capital felt the fury of the plague alike in the palace and the cot.

* * * * * * * * * * *

The churchyards were soon unable to contain the dead, and many houses left without inhabitants fell to ruins. In Avignon, the Pope found it necessary to consecrate the Rhone, that bodies might be thrown into the river without delay, as the churchyards would no longer hold them; so, likewise, in all populous cities, extraordinary measures were adopted, in order speedily to dispose of the dead. In Vienna, where for some time 1,200 inhabitants died daily, the interment of corpses in the churchyards and within the churches, was forthwith prohibited, and the dead were then arranged in layers, by thousands, in six large pits outside the city, as had already been done in Cairo and Paris.—*Ibid.*, p. 25.

I have said that I would not speak of that destruction of man which has come from the will of man;—else what waste might appear before us in the carnage of battles, the slaughter of storm and sack, wholesale murders by wicked kings, wholesale butcheries by savage mobs, and the torturing deaths instigated by fanatical and malignant priests. But one cannot wholly exclude wars from the category of those desolations which fall upon man against his will, when one thinks by how few minds and hands some of the most devastating wars have been directed.

When 60,000 soldiers lay stretched on the frozen plain of Eylau, and nearly a like number under a scorching sun on the field of Wagram, it cannot be said that, though struck down in war, they were the victims of their own violent passions. They lay there stiff in death, or writhing in anguish, because the ambition of one man willed it;—the heart of one man was reckless of the amount of suffering and misery and death, at which he purchased his ends, provided only he did attain them. Had a plague swept over the Palatinate, the people could not have been less the authors of their own calamities than they were, when the savage soldiers of Duras obeyed the orders issued from the *salons* of Versailles, with the consent of that bigoted voluptuary who boasted of his descent from St. Louis. And, indeed, in almost all wars but those of a purely defensive kind (and this exception applies to one side only) we must put the destruction of human life under the head of Waste; and I know not what other term will do so well for the heaps of skeletons which in our own time have encumbered the Khyber Pass, or which are strewn round the walls of Sebastopol, and still more for the corpses now rotting on the plains of Virginia.

Let us think, too, of the disappearance of whole races of mankind; and what havoc must have been made by the inroads of stronger races trampling down the weak,—driving them from their hunting fields, planting them out from their pastures, exterminating them by the cruelties, the diseases, the vices of civilized nations;—worse still, some of these civilized nations (for example, the Spaniards in America), smiting them down with the cross, in practical blasphemy of that symbol of love and pity. Even in our own milder times, there has been enough of extermination to make philanthropists set on foot a society, for the protection of aboriginal races.

These are some instances of one kind of waste of human life: but there is another view which indicates enormous waste, simply in the undeveloped potentiality of man. If we look over the map of the world, and consider how long it has been peopled, and how richly, and then consider what man now is, and how little he has attained to, comparatively, can we avoid thinking of waste? History tells us what myriads lie buried in the old Greek and Roman lands, and in all our modern Europe. Something, too, we know of the human relics that are blown about in the desert dust of Egypt and Palestine. Asia, mother of the nations, bewilders the imagination that tries to call up

the series of races that, according to the most limited chronology, have hung on her mighty breast. Whoever has dared to push towards the pestilential interior of that quarter of the world, the fringe only of which, till in these latter days, travellers have been contented to touch, has found human life ever teeming, ever exhaustless; while, in what we call the New World, cities actually overgrown by ancient forests, and remains of old polities long worn out, and traces of a civilization which it must have taken ages to accomplish, and which it has taken ages to efface, tell how man there, too, has abounded. I say nothing of the tribes now dimly looming through the mists which have enveloped the primeval anthropology of the earth, but which have had some light thrown upon them by the combined researches of the antiquarians and naturalists of these latter days. Every part of the survey increases our awe, and brings back on us a humiliating feeling of ignorance, far surpassing that which ensues on the contemplation of fossil infusoria and fossil saurians. We are sure, from various evidences, that it must have been all for ultimate good; how, we know not. Allow that the intellectual, and moral, and religious development of one race, is no measure for that of another, and that the capacities and susceptibilities in these respects are not equal nor alike; still in the lowest types of man there are germs of powers, possibilities of being, enough to make the inevitable question start to the mind,—what have all these men and women done since they breathed the breath of life? These countless tribes, with their quick senses, their nimble apprehensions, their marvellous hands, their erect stature, their "large discourse of reason," and their shaping fancies; what have they done in proportion to their numbers? Alas! the "vanity of vanities," which the preacher so mournfully ejaculated nigh three thousand years ago, was but another formula for what we are trying to discourse of under the category of Waste.

And yet something has been done; one race has given monuments to all succeeding ages of the height to which philosophy, and poetry, and art can rise: another of the power which men may attain by force of law and patriotism, and political organization; another of the gifts of God in the endowment and development of religious sense and religious knowledge; and the men of the present time have learned wonderful mechanical arts, and the virtues of social love and social compassion.

Yes, something has been done in some parts of the world. But,

alas! of that which has been done how much has perished! Cities innumerable have been absolutely swept away, and of the greatest the remains are meagre;—Babylon and Nineveh marked only by mounds, till the genius and industry of this age disinterred some wonderful relics; Thebes, with comparatively few fragments of temples, and obelisks, and sphinxes, and gigantic statues, yet unburied by the sand; Athens, not even the skeleton of its former strength and beauty, but with only a mutilated member here and there; and Rome, standing on the ruins of at least three predecessors; more, perhaps lying buried beneath than has since stood above, even when that, of which so little is left, was unimpaired. To these the least instructed in history will be able to add a long catalogue of other cities, of which a few present picturesque remains like Baalbec and Palmyra, others that survive only in their names, others with so little remaining except their names, that, like the Ephesus of Mr. Falkener, it is only to be reconstructed by means of the utmost ingenuity, fortified by all the resources of archæological knowledge, and artistic skill, and classical scholarship. But long lists of names of cities might be culled from ancient authors which are literally dead names, not having one single association in our minds, at least in ordinary minds. And, again, figures might be brought forward recounting the numbers of cities, the names of which have vanished even from the countries where they stood. It is an old lament, the lament over perished cities. Listen, for one moment, to this from the preface to Burton's "Anatomy of Melancholy":—

Tell me, politicians, why is the fruitful Palestina, noble Greece, Egypt, Asia Minor, so much decayed, and (mere carcases now) faln from what they were? The ground is the same;—but the government is altered; the people are grown slothful, idle; their good husbandry, policy and industry is decayed. *Non fatigata aut effeta humus* (as Columella well informs Sylvinus), *sed nostrâ fit inertiâ*, &c. May a man believe that which Aristotle, in his Politicks, Pausanias, Stephanus, Sophianus, Gerbelius, relate of Old Greece? I finde heretofore 70 cities in Epirus (overthrown by Paulus Æmilius), a goodly province in times past, now left desolate of good towns, and almost inhabitants;—62 cities in Macedonia, in Strabo's time. I find 30 in Laconia, but now scarce so many villages, saith Gerbelius. If any man, from Mount Täygetus, should view the countrey round about, and see *tot delicias, tot urbes per Peloponnesum dispersas*, so many delicate and brave built cities, with such cost and exquisite cunning, so neatly set out in Peleponnesus, he should perceive them now ruinous and overthrown, burnt, waste, desolate, and laid level with the ground. *Incredible dictu*, &c. And as he laments, *Quis talia fando, Temperet a lachrymis? Quis tam durus aut ferreus* (so he prosecutes it), who is he that can

sufficiently condole and commiserate these ruins? Where are those 4000 cities of Egypt; those hundred cities in Crete? Are they now come to two? What saith Pliny and Ælian of Old Italy? There were, in former ages, 1166 cities: Blondus and Machiavel both grant them now nothing near so populous and full of good towns as in the time of Augustus (for now Leander Abertus can find but 300 at most), and, if we may give credit to Livy, not then so strong and puissant as of old: "*They mustered 70 legions in former times, which now the known world will scarce yield.*" Alexander built 70 cities in a short space for his part: our Sultans and Turkes demolish twice as many, and leave all desolate. Many will not believe but that our island of Great Britain is now more populous than ever it was; yet let them read Bede, Leland, and others; they shall finde it most flourished in the Saxon Heptarchy, and in the Conquerours time was far better inhabited, than at this present. See that *Doomsday Book;* and shew me those thousands of parishes, which are now decayed, cities ruined, villages depopulated, &c.

But all such destruction points mainly to the waste of the larger works of man's hands, though there was indeed much of other waste, —much waste of the arts and the products of the arts that made life happy and enjoyable, and that elevated and embellished it—(as for instance what sculptures demolished, what frescoes effaced!)—and the loss of the genius and knowledge and skill which planned those cities, with all their towers and domes and temples, their theatres and palaces. But there has been still greater waste of thought in the lost literature of the world,—partly because the characters cannot be read, still more because the records are gone,—the books have perished. And it is a melancholy reflection that vast stores of knowledge so painfully hived up, that finest gems of thought so carefully polished, so carefully set, should have been not merely lost by the accidents of time, but should have also been recklessly and blindly destroyed by the animosity of hostile nations and hostile creeds.

"The literary treasures of antiquity," says Mr. D'Israeli, "have suffered from the malice of men, as well as that of time. It is remarkable that conquerors, in the moments of victory, or in the unsparing devastation of their rage, have not been satisfied with destroying *men*, but have even carried their vengeance to *books*. The Romans burnt the books of the Jews, of the Christians, and the Philosophers; the Jews burnt the books of the Christians and the Pagans; and the Christians burnt the books of the Pagans and the Jews. The greater part of the books of Origen and other heretics were continually burnt by the orthodox party." Gibbon pathetically describes the empty library of Alexandria, after the Christians had destroyed it. "The valuable library of Alexandria was pillaged or

destroyed; and nearly twenty years afterwards the appearance of the empty shelves excited the regret and indignation of every spectator, whose mind was not totally darkened by religious prejudice. The compositions of ancient genius, so many of which have irretrievably perished, might surely have been excepted from the wreck of idolatry, for the amusement and instruction of succeeding ages; and either the zeal or avarice of the Archbishop might have been satiated with the rich spoils which were the reward of his victory."

But the waste of disuse suggests reflections scarcely less mournful. Have you not felt when pacing along the galleries of great libraries, glancing from side to side at the labels and names on those piled up treasures, with their blazonry as faded and pale as the escutcheons in the adjoining churches,—have you not felt that those titles to immortality (for such the poor departed authors in the pride of their hearts conceived them to be), were, after all, the most impressive lessons that could be taught of the transitoriness of human glory, of the vanity of human expectations? It is sad to walk in a churchyard over the graves of nameless dead,—it is sadder to walk through cloisters of venerable colleges and cathedrals, and to see on the foot-worn pavement, and on the walls laden with pompous monuments, the names of men who, for all that we or thousands like us know about them, might just as well have been nameless. In vain does the poor weak voice cry out from the tomb, *siste viator!* We do not stop, for why should we? the tenant's name is nothing to us. We linger only a moment to admire the turn of phrase in the panegyric, or even, alas! only to smile at its quaint conceits; and if a serious thought comes over us it is not for those unknown dead, but for the sadness of the common doom that involves the hopes and joys and labours of all our race,—*quam vanæ sint spes quam fluxa sint hominum gaudia*,—"how vain the hopes of men, how fleeting are their joys." And so, I say, it is very mournful to glance at those unknown names and titles in our great libraries, which, indeed, are great cemeteries; and there lie the authors with all their glorious thoughts, their fine moralizings, their convincing arguments and eloquent admonitions, all coffined in the very volumes that were to keep them ever living; and the titles on the labels are little better than epitaphs, and for all that they bring to our minds, there might as well have been only a simple "*Hic jacet.*"

Such thoughts as these give us hints of the waste of oblivion. We just descry the objects before they are finally drawn behind the im-

penetrable curtain. But who shall conjecture what great, and heroic, and beneficent beings, what glorious and beautiful works, have been gathered into the eternal darkness, leaving not one wreck or token to tell the after ages how woeful has been their loss?

Under the term Waste, I have included the premature decay, or the destruction of that which has seemed to have a definite work to fulfil, or a definite place in the order and constitution of the universe. Instances have arisen before our minds in the perishing of organic forms before they have matured, in human beings cut off in their prime, in the destruction of human works, in the breaking up of parts of the material fabric of the world. We have seen enough to prove that such phenomena, anomalous as they at first sight appear, are too numerous to be regarded as exceptional. Such seeming chaos must somehow belong to the universal kosmos, for there is a continuity in the disruptions, a constancy in the changes, a sort of rhythm in the discords. Change is the soul of the world; all things are in flux, and there is nothing stationary but in the thought of man. He sees the seed sprout, and the stem spring up, and the flower blossom, and the seed form and fall, and he thinks that this is to happen over and over again in the same order. If in reality he saw the same things and the same forces at work, he would assuredly see the same results, for no one will dispute that the same antecedents will beget the same consequents. But he is in reality looking at different things, which only seem to be the same.

The faith in nature, and in her constancy and perfection, according to man's notion of constancy and perfection, leads to many errors of inference. The prevalence of definite forms in organic life has much to do with the idea in question. Yet how often is this same work of nature incomplete. You can scarcely find a plant with every leaf or petal perfect,—scarcely an animal in which there is not some defect, however trifling. The soil and the atmosphere, to which the seed and the animal are indigeneous, are a part of nature, as well as the organic beings in question; but the one often does not bear, and the other is cut off immature. Such facts belong as much to the system of nature, as the perfect organisms growing and flourishing, and they all come under the law of change and transmutation; and if we could see all, we should perceive that out of the decay and death life was ever

springing. Individual leaves, or blossoms, or seeds, or whole plants, may fail; but look at the ever-returning wealth of foliage, and the never failing flowers, and the teeming produce, and the swarming flocks and herds! The contingencies of blight and decay and destruction are provided against by a productiveness that will more than compensate for such losses. And those casualties, disturbing and distracting as they seem, would, if traced along their several lines and clusters of causes, be seen to bear the same order and arrangement as the phenomena which we more easily apprehend; and we should find all subordinated to laws of change, revolution, motion. The member must shrink, or be cast off, for the sake of the individual form; and the individual form goes for nothing in comparison with the species; and the species must end, when the time is come for the conditions of its existence to be altered.

Lightning and tempest—volcanoes and earthquakes—fog and frost—drought and deluge—dearth and blight and poison—old age, disease and death,—all belong to the same plan as sunshine, dews, and showers; and verdure, bloom, and vintage; and youth and health and strength and beauty.

It is the shortness of our time on earth, the limitation to our own powers of production, that makes us stand aghast at the contemplation of what we call waste. We propose to ourselves definite ends,—and for these we work, and design, and plan, and go through endless perplexities, and encounter endless obstacles; and if all our deliberations and contrivances and resolves and exertions fail in their purpose, we feel that our thought and care and toil have been spent in vain. And our hearts, as well as our minds and hands, may be disappointed. Ambition frustrated, hopes defeated, affections bereaved or blighted,—these, too, cause man to say,—Why all these throbbings, and agitations, and dreamings, and yearnings, if they were to come to nothing? Would it not be better not to feel, than to look back on such profitless expenditure of feelings—"the weary chase the wasted hour!" But man sees not as God sees.

> "The One remains,—the many change and pass,—
> Heaven's light for ever shines, earth's shadows fly:
> Life, like a dome of many colour'd glass,
> Stains the white radiance of eternity."

But the discontent of man comes from his greatness as well as from his littleness. It is because he has done so much with so much strength

and skill, that he is vexed that the work of his hands does not always accomplish his wishes, or that, when they have been completed, still the works are not abiding. Lord of Nature and her finite beings, subjugating the qualities of matter and the forces of matter to his will and purpose; creating nothing, but taking command of the powers of nature and compelling them to work under new combinations, so as to supply his wants, and augment his pleasures, and gratify his pride; and dealing with form and colour and sound, so that things in the outward world shall be copies of the ideas in his mind, and present to other men, and for ages on ages, the same thoughts and feelings which he was the first to conceive; he is dissatisfied when, in the courses of time, and the fatal conjunctures of chance, the things which he had bound together fall asunder, and the old undisciplined forces of nature resume their sway, and the primitive combinations of elements return to what they were, before he took possession of them, and set them in new places, and gave them new work and new functions; and he is mortified because his webs are unwoven, and his compositions dissolved, and his forms effaced; and he sighs out his "vanity of vanities," as if he had a right that his works should abide for ever. And from this state of feeling he is apt when looking at the works which are none of his, to transfer his sentiments, or to extend his sympathy to the gods themselves; for he mourns over the waste of the riches, and over the losses and destruction and decay of the works of nature, as if they were his own. But this superfluous lamentation and compassion comes from his shortsightedness.

In the processes of nature we must look beyond the seemingly marked divisions. These are mere resting places for mortal thought. Combinations and compositions are but for a time. The elements, of which they are made, arrange themselves ever anew. The form seems to vanish, but its essence has not melted away; it has become another, it is transformed.

Is it asked, why were not things differently adjusted? Why the struggle for life? Why so precarious a dependence on the elements? Why those fatal competitions and conflicts? Why the ineffectual battle of the weak with the strong? Why should the mights almost always become the rights? Why such profuseness in production, only to provide for the certainty of failure and extinction? Why should humanity have been made so prone to multiplication, that, in order to maintain a due proportion to the means of subsistence, there must be

reductions by such terrible processes as war, pestilence, and famine? These and a thousand like questions are the absurd and unprofitable speculations of human ignorance.

If, with our limited range of view, standing, as we do, on so very low a terrace for any prospect of the universe,—if even so standing and looking, we can discover a predominance of good over evil, and discern that some of the works of ravage and dissolution lead on to happiness and beauty, we ought to be content and believe that it is so with all. And the more we reflect, the more we shall be convinced that the waste, over which we mourn, is not really waste but transformation, the most striking type of which is seen in the mutual changes of the great forces of nature; heat passing into electricity, this into chemical attraction, and this into mechanical motion, and this again back into heat and light. For these forces are ever vanishing, ever re-appearing, ever destroyed yet ever preserved, going through endless phases of regenesis by virtue of their reciprocal convertibility.

Moreover, if we review, though hastily, the ground which has been traversed, we shall perceive that, in some instances, phenomena, which appeared at first sight very disastrous, are balanced by compensations, or prove to have been of only temporary duration. The fabric of the solid earth may be broken and dissolved in one part, but it is built up and added to in another. The rivers that rush down the mountain, ploughing it or planing it away, are elsewhere "sowing the continents to be." "The mud, sand, and other detritus," says Dr. Mantell, "thus produced, are reconsolidated by certain chemical changes which are in constant activity, both on the land and in the depths of the ocean, and new rocks are thus in progress of formation." "Elevations and subsidences," says Dr. Buckland, "inclinations and contortions, fractures and dislocations, are phenomena which although at first sight they present only the appearance of disorder and confusion, yet, when fully understood, demonstrate the existence of order, method and design, even in the operations of the most turbulent among the many mighty physical forces, which have affected the terraqueous globe."

Again, while the sea makes such encroachments on the land as we noticed in the earlier part of the lecture, we know, on the other hand, that it retires from other shores, leaving vast tracts of fertile land reclaimable by man's industry; and there are names on our maps, which tell that the towns which bore them were once sea harbours, though now lying far inland.

The very deaths of plants must give life to innumerable other forms; and our artificial system of fertilization obviously consists in making use of the remains of organic beings which have perished. But all examples of such conversion of loss into gain shrink in extent before the great carboniferous deposits. Those spoils of ancient forests were transported to lakes and estuaries, and there buried, or, we should rather say, stored up in subterranean treasure-houses for the future use of man, and then by a series of volcanic revolutions lifted up to within his reach. It was not for nothing that the grand and stately forests of palms were sepulchred in the depths of the earth. But for all that enormous destruction, where would have been the blazing hearths of England?—where those wonderful changes, social and national, that are involved in the mechanical applications of steam?

In adducing some striking instances of the devastations of pestilence, we went back to the fourteenth century. There have been many terrible plagues since that Black Plague, and the cholera of our own time is not to be forgotten. But still there has been a notable though a gradual diminution of such visitations. The steady progress of improvement in sanitary knowledge and sanitary practice, at least in Europe, has abated much of the virulence of the diseases that were formerly so destructive. And the great triumphs of Jenner's discovery are never to be kept out of view, though one of the very effects of it has been that of removing from sight the signs of the existence of that evil which his genius and perseverance taught man to avert. Of many diseases the mortality has been greatly reduced by the advance of science; and even as to epidemics, though, when they have come, they have been apt to exact their dues, with a frightful rigour, from those who have fallen within their power; yet there is good reason for believing, that in the progress of social improvements they will find fewer and fewer subjects.

The lost literature of the world, as we glanced at it, seemed a woeful illustration of waste. But as to even this deprivation we can discern some topics of solace and reconcilement. Of what has perished it is probable that a large part was not worth preserving; another part having fulfilled its temporary function has died away; and of another part it may be said, that what was really valuable in it has been insensibly gathered into the collective thoughts of educated minds. There have been books which were valuable for the know-

ledge they contained: but their essence has long since been distilled and absorbed into the general knowledge of mankind; and the original sources are objects of curiosity rather than of use. This may be said of nearly all the literature of science. But the case is different in regard to those writings, the excellence of which consists in the beauty of their composition. The loss of these we must regret, like that of fine paintings and sculptures, the form and colour of which are essential to their character. The truths which Newton discovered would remain with us, if his "Principia" and other treatises had sunk in that fatal river of Time, which, Lord Bacon tells us, drowns what is weighty and precious, and floats down only what is light and worthless. But if the actual Odyssey, and Hamlet, and Paradise Lost, were gone, no one could tell another what they were. The words themselves in their collocation are as essential as the thoughts; the form is no less indispensable than the substance. But such works form but a small proportion of great libraries. And of that small proportion, comparatively little can be enjoyed by even industrious students, distracted as they must be by the ever increasing literature of the times they live in. Nor is it needful to think only of this prolific age, with its journalism ever presenting new and stronger claims on attention. More than two centuries ago literature seemed redundant.

In 1632 (says Mr. Masson, in his life of Milton) just as now, people complained of a plethora of books. "Good God," says Wither, in his *Scholar's Purgatory*, "how many dung-boats full of fruitless volumes do they yearly foist upon his Majesty's subjects; how many hundred reams of foolish, profane, and senseless ballads do they quarterly disperse abroad."—(Vol. i. p. 150.)

And Sir Thomas Browne expresses a like feeling:—

I have heard (he says) some with deep sighs lament the lost lines of Cicero; others with as many groans deplore the combustion of the library of Alexandria; for my own part I think there be too many in the world, and could with patience behold the urn and ashes of the Vatican, could I, with a few others, recover the perished leaves of Solomon. * * * * 'Tis not a melancholy *utinam* of my own, but the desires of better heads, that there were a general synod; not to unite the incompatible differences of religion, but for the benefit of learning, to reduce it, as it lay at first, in a few and solid Authors; and to condemn to the fire those swarms of rhapsodies begotten only to distract and abuse the weaker judgments of scholars, and to maintain the trade and mystery of Typographers.—(Relig. Med. sec. 24.)

It is curious to notice the different aspects under which the waste of literature appears to the same person at different times. I have

quoted Gibbon's lamentation over the first destruction of the library of Alexandria by a Christian Bishop. With his usual partiality he speaks more leniently of the second destruction by the Mahometans:—

> I sincerely (he says) regret the more valuable libraries which have been involved in the ruin of the Roman Empire; but when I seriously compute the lapse of ages, the waste of ignorance, and the calamities of war, our treasures rather than our losses are the objects of my surprise. Many curious and interesting facts are buried in oblivion; the three great histories of Rome have been transmitted to our hands in a mutilated state; and we are deprived of many pleasing compositions of the lyric, iambic, and dramatic poetry of the Greeks. Yet we should gratefully remember that the mischances of time and accident have spared the classic works to which the suffrage of antiquity had adjudged the first place of genius and glory; the teachers of ancient knowledge, who are still extant, had perused and compared the writings of their predecessors; nor can it fairly be presumed that any important truth, any useful discovery in art or nature, has been snatched away from the curiosity of modern ages.

As to the destruction of races of men, it may console us to bear in mind, that if the individual man must not repine at changes which, though they ruin him, add to the happiness of multitudes of his fellow men, it cannot be our duty to mourn over the disappearance of races, which have been superseded by others, of higher endowments and larger capacities. The modes in which they have perished, or been absorbed, or amalgamated, may have been painful to contemplate; but those dreadful facts belong to the category of questions for which, as we have already hinted, there is at present no solution,—there being no rest for the perplexed, inquiring mind, but in the belief that they belong to the working of a Divine plan of the universe that must end in good, though in an unknown way. And even with our present perceptions, and powers of understanding, if we survey the countries where such changes of inhabitants have taken place, I cannot imagine that anyone would desire that those changes should be reversed. The Mohawk and the Chippewa may be fine figures for the imagination; and stirring tales may be told of their strength of limb, and marvellous quickness of eye and ear, and of their love of justice, and of their possession of some few domestic virtues, and some shadowy notions of religion; but who would wish them to return to their hunting grounds with their painted skins, and their tomahawks and scalping knives, or even with their rude implements of the chase and their primitive wigwams, and to occupy these regions where another race, however intrusive in the first instance, has now spread fields of waving corn,

and scattered the land over with smiling homesteads, and built great cities with churches and colleges and halls of state, and introduced the ennobling sciences and refining arts of the highest civilization achieved by man? No. Alas! for the poor Aborigines! Alas! for their struggle for existence, their pangs, their heart-breakings, their many miseries! They must go; "some natural tears we shed, but wipe them soon." They must fall under the general law. So vanished the Canaanites before those wondrous Children who were to be the learners and teachers of the best and purest religion mankind has ever known. So vanished the Pelasgians before the Hellenes, who were to be the authors of the profoundest philosophy, and the creators of the highest poetry and the finest arts. So vanished the Etrurians and Oscans, and Umbrians, before the race that was to teach law, and political organization, and scientific warfare. So vanished the allophyllian races of our northern Europe, before those branches of the great Aryan stock, who brought the useful arts, the mechanical inventions, the comforts of life, and, in the fulness of time, and under the inspiration of Christianity, the mitigations of suffering, the sympathy for the afflicted, the pity for the poor, and the sorrow for the sinful, embodied in the hospitals and asylums and reformatory institutions of our modern life.

And with such reflections in our minds we cannot mourn over the waste of the old cities. They are gone. Be it so. Would you build up Thebes again? and again see the worship of the cat, and the cow, and the ibis, even allowing that such superstitious practices were symbolical of esoteric doctrines highly abstract and spiritual? Would you raise up ancient Rome, and recall her Romans, with their cruel, pitiless conquests, their insulting triumphs, their butcherly and debasing sports? One would rather have even modern Rome with her spies, and her dungeons; for the misery she inflicts by her bigotry and tyranny, is at least on a smaller scale.

But Athens—could we recover Athens from the wreck, would it not be a temptation to wish the order of changes rolled back to what she was, when Pericles ruled the destinies of grander intellects, finer fancies, more cunning hands, more delicate senses, more eloquent tongues than the world has known before or since. Had we the architects and sculptors, would we not rebuild her Parthenon and Erectheum, repair and set up again her Theseus and Ilissus, and all "those forms that mock the eternal dead in marble immortality," and bid her sages once

more "walk the olive grove of Academe," and recall the silent voices of her orators and poets? No; it is better as it is. Fancy must not be allowed to dazzle the eyes of our judgment with the picture of that city;

> "A city such as vision
> Builds from the purple crags and silver towers
> Of battlemented cloud, as in derision
> Of kingliest masonry."

We must not forget what was wanting to her citizens, and which we now possess, with our riper civilization, our advanced sciences, our mighty arts, our purer morals, our holier religion. One thought alone is enough to make us acquiesce even in the ruin of ancient Athens. While knowledge and wisdom were embodied in Pallas Athenè, and much that was charming was represented by Aphroditè, yet those higher sentiments and associations which arise in *our* minds with the name of woman, were not in the minds of the Greeks. Centuries upon centuries of confusion, and misery, and darkness, had to pass over "poor humanity's afflicted will," before that beautiful phase of our modern life was evolved, which represents the ideas contained in chivalry, and the acknowledgment by man of that softening, elevating, and refining process, which he owes to the purer soul, and the more loving heart of woman. This the Greeks had not; so let them go, and their peerless city with them.

If we could, we would not have them again; nor can we join with Schiller in wishing to revive their beautiful mythology. Rather would we apostrophise their gods in the language of one of our own poets:—

> "Very pale ye seem to rise
> Ghosts of Grecian deities!
> * * * * *
> Gods bereaved, gods belated,—
> With your purples rent asunder!
> Gods discrowned and desecrated,
> Disinherited of thunder!
> * * * * *
> Get to dust, as common mortals,
> By a common doom and track!
> Let no Schiller from the portals
> Of that Hades call you back,—
> Or instruct us to weep all
> At your antique funeral.
> Pan, Pan is dead!"

Were it merely to indulge our curiosity, one would like to reanimate the dwellers in such cities as those of old Etruria, about whom we know so little. But they are gone; they have had their day and their place. As to all that is gone from the world, there must have been a reason for its departure as well as for its coming. Death is in the scheme of the universe no less than life. So we must be content to say with solemn reverence,—

"Let the dead past bury its dead."

Could we from some far-off extra-mundane station look at events which near at hand seem so disastrous,—all the destruction and havoc and desolation in the world,—they would, probably, under so different an angle of vision, assume an entirely different aspect. The whole system of things being one of unceasing change and flux, such terms as death, and waste, and wreck, and ruin, would lose their significance; they would melt into ideas of unfolding, disintegration, repulsion, and separation; links in that great chain which is also made up of works of development, attraction, composition, and formation, which are for ever going on, since motion is the ultimate law of the universe. The mutations in the solid fabric of the earth, whether gradual or abrupt, at which our imagination is so much amazed and almost frightened, would look like undulations, heavings, and subsidences,—dissolving views of a sublime order of changes; the replacement of old cities by new would appear as little more than kaleidoscopic recombinations; and the busy, striving, toiling, battling tribes of men, falling away here and re-appearing there, would harmonize with the varying scenes of the vegetable world,—the uprooting of forests,—the springing of flowers, and herbs, and crops, and plantations, where once were desert plains or monotonous prairies,—and the rising of lovely islands from the bosom of the barren sea.

And all would be seen as order, growth, development, in the midst of disruption, disintegration, and decay. Under our limited powers of observation, the shifting atoms of organic forms are so insensibly replaced by like atoms, in like combinations, that perfect similarity is mistaken for identity. The rosy cheek of youth, and the brilliant eye of beauty, are undergoing perpetual dissolution and recomposition in the midst of their health and loveliness. With vision microscopically sharpened, we should at every moment discern, in the marvellous processes of cellular life, destruction, decay, and separation,

alternating with repair, and growth, and re-union. And so the great globe itself, which to our mortal survey seems covered and confused with waste, and wreck, and ravage, may to the mental eye, removed far off by imagination, or by philosophic abstraction, present only the varying phases of renovation and reproduction, which are ever prevailing over inevitable revolutions and destructions.

All the teachings of experience, and all the divinations of analogy, lead us to believe that those chances and changes and metamorphoses will ever eventuate, sooner or later, in something better and nobler; and that the new earth and the new Heavens which the highest and purest minds have been inspired to look for, and to prefigure in solemn vision, will infinitely surpass in beauty and glory all those which have gone before them.

TEN YEARS.

A Lecture delivered at the Bristol Institution, January 14, 1861.

TEN years! It is after all a large portion of time. It is a seventh of the period allotted by the Hebrew Psalmist to the individuals of our race, as a season worth possessing. It is a tenth of that segment of time which is the symbol of long duration,—one of the great marks on the dial-plate of the world's horologe—a division which multiplied by a very few figures carries us into far-off ages, past æons, *sæcula sæculorum*. It is a tenth of that of which there have not been thirty since the heroic, pre-historic age of Greece; not sixty, according to the orthodox chronology of Archbishop Usher, since the creation of Adam. To us, in our comparatively uneventful tenour of individual biography, a decade may glide stealthily away, and in memory be curdled into much less than an hour. But a glance at the great records of the world will suffice to raise it into something of solemn, nay, fearful significance. What heavings and convulsions of the whole framework of society—what polities abolished and refounded—what desolations of war—what revivals of peace—what thrones set up and shaken down—what dynasties dead, buried, and resuscitated—what glorious martyrdoms—what tragedies of heroes—what delirium of kings—what sorrows and sufferings of peoples—what sad disastrous eclipse of freedom and intellectual life—what heavenly radiances, as new hopes and restitutions have seemed to open on the destinies of man! How in one ten years has "a great æon set in blood," and in another uprisen like a laughing Aurora!

There was a people of ancient times, the oldest of which we have authentic traces. They looked far into futurity, and they built temples and piled up monuments, and carved and coloured them as if their works should abide for ever. And there were no earthquakes to swallow them, no lava and ashes to overwhelm them, no hailstones to furrow them, no dews to eat into them, no fogs to blister them. And through how many centuries, which some think almost countless, those pyramids and sphinxes and obelisks stood unscathed! But there *did* come a change; and in less than ten years their beauty was marred and their grandeur shattered, or hardly to be traced except in the greatness of their ruin, in the dimensions of fragments, and in the disfigurement of masses which had only escaped entire downfall and demolition, because they were more like natural rocks than the carven stones of human handiwork. And this destruction and desolation was left by the simoom-like sweep of mad barbarians. On those plains, which have since resounded with the clash of the Macedonian phalanx, with the alalagmos of the Roman legions, with the rush of Moslem cavalry, with the roar of French artillery, and with the steady tramp of British infantry, the old monarchs of the lines of Amunoph, Thothmes, and Rameses, might still look down from their colossal statues. With their solemn, sedate, and kingly eyes (such as are yet visible on the walls of their sepulchres), they might still be looking down on the scenes of their ancient glory, but for the havoc and wreck and ravage of those ten years which were given to the license of the drunken insensate Cambyses.

There was another ancient people whose existence exerted far more important influence on the fortunes of the human race than did that of the Egyptians. In the ideas which they originated; in the systems of thought and reasoning which they organized; in the recitals which they have left of what they had themselves observed, or of what had been told or handed down to them by others; in their imaginings of what had been done in the world before tradition had spoken, or history had written; in their singular perception of beauty, and in their power of producing it in forms which remain to this day, and make moderns divided in judgment as to whether what those sculptors and architects saw was more harmonious in proportion and more lovely in form than can be seen now, or whether their wonderful works sprang from their pure creative power, their gift both of idealising and of realising their ideals; in their mastery of language; in their

combination of what satisfies and charms the ear by rhythmical periods and metrical cadences, with clear and vivid representations of the forms and colours of the outward world, of the emotions and affections and sentiments of the inner life, and of action and of passion among men; in their renderings, too, of things done and characters evolved in the world of imagination—deeds and agents and events that never were but which might have been, for the creations were all true to the laws of thought, and the laws of the world as then understood;—in a word, this people in their philosophy and literature and art, in their poems and histories and orations, in their theogonies and mythologies, their logic and rhetoric and mathematics, their temples and friezes and statues, their Iliad and Odyssey, their Prometheus and Antigone, their Phædo and Philippica, their Square of the Hypothenuse, their Theseus and Aphrodite,—in all these and innumerable other particulars they have informed and educated, and they will continue to inform and educate mankind by theory and by example to remotest times. They have left types and models never to be surpassed, some never to be equalled; and canons of thought and rules of art that will never grow old and obsolete. But there were ten years when all these priceless legacies to mankind were in peril, or rather when the germs of what was afterwards to be developed into so much glory and beauty might have been utterly blighted. What would the world have been now, if before the Greek literature and philosophy and æsthetics had arisen, if Attica had become a satrapy of Persia, if the grand Hellenic mind had been swamped by the Asiatic, if enlightened republics freely speaking, freely acting, had been overwhelmed by barbarian despotism. Grant what you will to the splendour of oriental fancy, to the magnificence of oriental architecture; allow what you choose to the acuteness of oriental intellect, to the subtlety of oriental metaphysics; but imagine exchanging the clear-cut compact works of Greek thought for any thing that we have received from the arts and letters of the East! Imagine the exchange of Sophocles and Pindar for Hafiz and Sadi, Ethics of Aristotle for mystical Zenda Vestas, gods of the Parthenon for bulls of Nineveh! Who can tell whether this, and worse than this, might not have happened but for the glorious ten years which began with Marathon and ended with Salamis.

On that struggle and what it preserved for us we can look back with gratitude on our own account, and for the sake of the intellectual interests of the whole civilized world. But after ten centuries had

passed there was another ten years, more astonishing in its events, more influential at the time on great masses of mankind, and the results of which astound us even to this day. Let us think for a moment of the career of that extraordinary man who having had to fly for life from a paltry tribe, with a handful of devoted associates, devoted only from their belief in his authority from the Unseen Powers, was enabled by means of that prophetic ardour which comes to a man from his conviction that he has attained to some truth which is *instar omnium*, which includes all truths and all the duties which bind him and his fellow men in respect to this world and the world beyond,—was, I say, by means of that ardour and the practical tact and wisdom so often found to be co-existent with enthusiasm, and with no other help than the zeal which he had imparted to his followers and disciples, was enabled after ten years, comprising I know not what fasts and fightings, what terrible crises of impending defeat or death, so to beat down all his enemies, and to inspire such trust in his supernatural mission and invincible fortunes, that after only ten years from his memorable flight to the end of his victorious career he had raised himself to the sovereignty of a mighty people. This people, or federation of tribes, were so heated by the united flames of his spiritual propagandism and his worldly ambition, that after one century only that singular Hegira became the date of a new order of things, not only to the countless tribes that swarmed in Arabia, but to all the tawny or darker-coloured races that filled the southern shores of the Mediterranean to the far west, or northwards to the sallow nomades of the Steppes of Tartary, and eastwards even to the sable children of Delhi. In that period how many cities of old renown had been compelled to open their gates to the representatives of the fugitive from Mecca! The mind is almost overwhelmed by the multitudinous associations which such names evoke. The banner of the Moslem waved above the palaces of Susa and the towers of Damascus; it profaned the walls of Jerusalem; it insulted the peristyles of Alexandria and the obelisks of Memphis; it flouted the broken colonnades of Baalbec and the venerable ruins of Carthage; and it triumphed over the pillars of Hercules. At what famous rivers did not "their foaming cavalry" slake their thirst? The world-old Euphrates and Tigris, the mysterious Oxus, the territorial Indus, the sacred Nile, the peerless Guadalquiver. What seas had not been stared at by the wild eyes of those wanderers from sandy deserts? Their tents had fringed the shores not only of

the Red Sea and the Persian Gulf, but also of the Caspian, the Euxine, the Mediterranean and the Atlantic. And this century of conquest had never been, but for that marvellous decade from the Hegira to the death of Mohammed!

Our human craving for final causes is somewhat satisfied when we trace the effects of the Grecian decade on the intellectual life of Europe down to our own times. But what part in the tuition of the human race has been fulfilled by the splendid successes of the Moslem fanatics? May their one dogmatic formula atone by its monotheistic purity for the ferocity, the bigotry, the sensuality, the cruel rapacity of the Mussulman! Or are we to admit that in the maxims and precepts of the Koran there lies hid some mysterious organising and conservative power, specially fitted for binding and holding together those vast Asiatic polities? We are perplexed as we survey a chart of the religions of the world and observe that the professors of Islam number no less than 124 millions. We must confess with humility how very feebly we can apprehend the counsels of Providence in the development of other races than our own European branch of the great Aryan stock.

Let us turn from the contemplation of this strange phase of history, so barren and depressing to the mental vision. Let us pass over another thousand years, from the seventh to the seventeenth century, and we alight on a ten years, the value of which to human happiness and liberty cannot be surpassed by any period of like extent in the history of our race (always excepting those three years in Palestine, too solemn to be dwelt on here, but the very thought of which must ever send a thrill through all hearts in Christendom). You will have anticipated me, and will know that I am alluding to the space between 1640 and 1650. It is not for me to hold up to reprobation the stubbornness of the one party or to palliate the excesses of the other;—but I may remark in passing that considering the magnitude of the stake, the heat of the passions called forth, the apparent sanction of high moral and religious principles of action on either side, it will ever be one of the worthiest of our national boasts that in the terrible conflicts of that time, notwithstanding what may now seem to have been needless severities and retributions, the humanities of strife were observed to a degree beyond what would be found in any struggle of equal duration and intensity in the history of any other nation. It was a fearful but a glorious period. There was a fair and open field, and the time had come when it had to be proved whether the popular

mind and will had really passed through its stages of infancy and childhood, had outgrown the necessity for the tutelary care of Divine Prerogative of Kings, Divine Prerogative of Priests, and was strong and sturdy enough to take care of itself, or rather to partake of the counsels of legislators, and of the transactions of executive governments. It was not to be expected that the hereditary privileges, the aristocratic traditions, the ecclesiastic prescriptions of centuries, should succumb without a struggle. Great were the virtues put to the trial in that collision;—faith in God, faithfulness to a King—devotion to the Highest, devotedness to His Vicegerent—sacred ardour for liberty, sacred ardour for loyalty—and sacrifice of life and fortune and kindred for both. We mourn for the inevitable losses;—chivalrous Falklands, intrepid Hampdens, graceful helpless Charleses—but it was an awful issue that was fought, and the men who conquered were stirred by the sacred strains of the warrior-bards of Judah, and they were ruled by that natural voice of command with which Heaven had endowed the storm-compelling Oliver. The liberties of thought and speech, of conscience and action, won for the people of England in those memorable ten years, were won for remote ages and peoples. They travel round the world with the Anglo-Saxon tongue. Whatever excesses or effervescences they may have run into in their first burst, with whatever ultra-republican theories they may have been mixed and confounded, the principles of constitutional freedom pleaded in the Petition of Right, asserted in the Grand Remonstrance, battled for at Marston, and won at Naseby, we are daily and hourly enjoying; and they are found to work in perfect harmony with that deep-rooted sentiment of our nation,—

"Our loyal passion for our temperate Kings."

God grant that like principles may so work in the revived nationalities on the northern shores of the Mediterranean!

But this thought of "ten years" has led me into themes almost as worn as the ten years' war in Troy. Did I not fear to weary you with iteration of the period I would ask you to look for memorable decades in the lives of Great Men. In the lives of long-aged men how often has it happened that their principal achievements, those by which they have gained their places among the Immortals, were comprehended within the same narrow space. But this observation applies chiefly to those reputations the bearers of which have distinguished themselves

in important national crises. Great wars, great political perturbations, happily do not often extend through the whole active part of even an average lifetime. It is when high capabilities of action concur with extraordinary emergencies that great fames arise suddenly;—the hour and the man—the knot to be cut and the sword sharp enough to cut it—must come together. If it be true that "the world knows nothing of its greatest men," it is because they have not been fortunate enough to light upon a fitting stage for the display of their powers. Of such men the affairs have not had that tide, "which taken at the turn" would have led to fortune. Had there been no War of the Succession, the English nation would have lost that splendid wreath, the several leaves of which are inscribed with the names of Blenheim, Ramillies, Oudenarde, and Malplaquet. Instead of Marlborough, a type of the highest military glory the world has seen, we might have scarcely remembered the name of Churchill among the political intriguers of the reigns of James and Anne, or remembered it as slurred with imputations of treachery to an indulgent master, and of an avarice that could not withstand the corruption of even the bitterest enemy of his country. But those famous victories, and many others which ennobled the career of that great commander, were all comprised within less than ten years, nay, in half the time. Blenheim was fought in 1704 and Malplaquet in 1709.

Another great pride of our nation, and a hero of more single-minded and more chivalrous stamp, Nelson, was toiling and bleeding for his country a much longer time than the other, but those outbursts of valour and genius which gave him his deathless renown, from the time when off St. Vincent he encountered the *Santissima Trinidad* till that glorious day when he utterly broke the naval powers of France and Spain off Trafalgar, all flash on the page of history in so quick succession as to make almost a continuous light. The space occupied falls considerably short of ten years. The first of those achievements was in 1797; and the greatest naval hero of English history, full of such heroes, ended his fame and his life in 1805,—two years short of a decade.

And it is curious to note that within even less than this period, that wonderful series of successes was included, by which another of our countrymen gained an imperishable name. Sir Arthur Wellesley landed in Portugal in 1808. The Duke of Wellington fought the battle of Waterloo in 1815. Honoured as he is in our memory for

his truthfulness, his simplicity, justice, solid sense, practic wisdom, and temperateness of judgment, tried and proved in so many crises in the civil affairs of his country, his name would have fallen into a confused throng of political chiefs of the second rank, and far below the Chathams and Pitts, and Foxes and Cannings, or would have been only coupled with the brilliant charge at Assaye, but for the opportunities which he found and used with so consummate a military genius in those memorable seven years.

Many other examples might be discovered if we sought them of the high reputations attained to in a brief period, because the great deeds which procured them were engendered of the public events with which their authors had been mingled. It is different if we survey the world of thought. High renown in philosophy and literature is not often obtained by the labours and productions of a single decade of years. It is true that one or two striking exceptions start up in apparent contradiction to this remark. The best of Lord Byron's poems were given to the world between that memorable morning when, as he said, "he awoke and found himself famous," and the ten years that followed. The star of Shelley's genius, though fixed for ever in the heaven of song, described a smaller arc above the horizon of human life, and that of Keats a still smaller. But of each of these it might be said that the career was over hasty. Too much was crowded into the time. Prematurity and immaturity belong more or less to all,—being incident to the over-growth of sickly constitutions. Firmer mental health, more patient enduring toil, longer and more thoughtful observation and experience of life, might have enabled each of these great geniuses to produce works of more solid and compact fabric than any they have left behind them. Our greatest poets, Chaucer, Shakspeare, Spenser and Milton, worked over long periods. Though the Paradise Lost was composed in a few years, yet more than twenty years before that time its author had published Comus and Lycidas, and in the intermediate time he had, as he tells us, overplied his eyes

> "In liberty's defence, his noble task,
> Of which all Europe rang from side to side."

In science and philosophy a very large majority of the great names would be found to belong to men who had been toiling through two or three decades. How very few are to be found so fortunate as Sir Humphrey Davy, whose grandest discoveries ranged over the first ten

years of the present century. And for the most part revelations made to man by outward nature come only after long, humble, and patient devotion, determined and importunate interrogation, unwearied wrestlings for the blessing of knowledge, a blessing that like all of the intellectual and spiritual order does not cease with the first recipient, but is handed on to long ages of inheritors.

If we turn from these wanderings to review the progress of Science during the last ten years, I am not aware that our view can be arrested by any single discovery which can match those which illustrated the preceding decades of the century. I do not know of anything that could rival the discovery of the alkaline metallic bases of Davy; or the fossil geology of Cuvier;* or the Analysis of the Nervous System by Charles Bell; or the identification of Magnetism with Electricity by Oersted; or the divination by Adams and Le Verrier, that there must be a planet in a particular situation, which was afterwards actually found; or the recognition by certain German chemists of nitrogenous compounds in the vegetable kingdom analogous to those in the animal; or the transcendental Anatomy of Oken, and Serres, and St. Hilaire; or the Silurian researches of Sedgwick and Murchison; or the Glacier discoveries of Forbes; or the Volcanic investigations of Daubeny; or such practical inventions as the Locomotive of Stephenson; the Electric Telegraph of Wheatstone; the Photography of Talbot and Daguerre; and the Penny Postage of Rowland Hill. Still, though there may have been no single star of the first magnitude to attract our vision in the discoveries of this last decade, there has been an increasing diffusion of light. Admitted principles have received further extension. The inventions of former decades have produced results in this, far exceeding what could have been anticipated at their birth. For example, I presume it was not expected when the first message ran along the wires between London and Blackwall, that before many years should have passed, the old and the new world would through a like medium exchange greetings; and (so rapid is the succession of modern events) not much more than three centuries from the time when the one hemisphere became acquainted with its other half.

* The "Ossemens Fossiles" of Cuvier was actually published just before the beginning of this century (1798), but the celebrity of the work came later.

So far as it is possible for one like myself to catch glimpses of the progress of science, it seems that the enormous collection of observations generated almost every day by those parent discoveries and inventions to which I have adverted, must, by the illustrative importance of some of them, and by the practical value of others in their applicability to the various wants and uses of mankind,—must constitute a family well worthy of their wonderful progenitors. The organic chemistry and the agricultural improvements of these days prove that Berzelius and Mulder and Liebig did not discover in vain. Stephenson surveying Bradshaw's Railway Map of Europe would have stronger evidence than any previous inventor had ever had presented to him, that his own and the next generation had been willing to accept and to turn to good account the boon which he had bestowed upon mankind. Professor Wheatstone cannot take up a newspaper, some column of which does not tell him how the extension of his discovery has marched with a velocity, somewhat comparable to that of the agent which has brought us tidings of the victories of armies almost before the cannon which won them had ceased to boom. And if Sir Rowland Hill is not able to witness the extent of his beneficent invention, it is only because he is not ubiquitous, and cannot enter the homes and see the daily lives of millions on the face of the globe,—homes and lives cheered, sustained, and comforted by that communication with friends and kindred, which meets one of the strongest yearnings of the human heart.

But more interesting than this energetic adoption of suggestions for multiplying useful arts and inventions, more interesting to the mind of the philosopher, have been the reasonings of those lofty intellects which have endeavoured to introduce larger generalizations of facts,—to simplify the laws by which the phenomenal world is governed. What could be more satisfying to our desire for knowledge of the degrees of relationship between phenomena, or of their causative connection, than Mr. Grove's admirable treatise on the Correlations of Force, showing how heat, and light, and electricity, and galvanism, and magnetism, and chemical attraction, and mechanical motion, are all reciprocally convertible; or those profound speculations of Faraday on the Conservation of Force, founded on the belief that motion is never lost, but that when apparently lost it has only passed into some other form. As a consequence of these discoveries it seems to my own humble apprehension probable that we may be not very far removed

from some great generalization, which will include not only all these forces with their reciprocal transmutations, but also the attraction of gravity. At all events we may hope to arrive at some more satisfactory notion than what has hitherto been conceived of motion and force, which are little better than provisional terms. Force cannot be severed from matter, and matter is only known through force;—and forces are only modes of motion in matter. When we try to separate matter and motion we fail, and only come upon fresh proofs that they are inseparable. We can give no account of matter other than a recital of its qualities, which when analysed involve the idea of motion; and we cannot conceive motion without matter as the subject of it. There is no rest. All is change, an everlasting shifting of position, and variation of arrangement, whether in the polarising atoms of the most solid substance,—or in that mighty revolution of sidereal systems which astronomers can infer but which no imagination can depict—or in the friction and undulation of that impalpable, insensible ether, which, like the conceptions of the metaphysician, *solâ mentis acie distinguitur*, is discerned only by the mental vision. This is one of the many points in which physics and metaphysics touch each other, in which matter melts away into thought—almost into "such stuff as dreams are made of." All things are as they are thought of or experienced; "nothing *is*, but all things seem;" and the objective is absorbed into the subjective.

All forces are modes of motion; but motion itself is a mode of thought. It is twin-born with time, and so united that the one idea cannot exist without the other. It is no less inextricable from time or successive duration, than rest is from space. Contemplate space without time, and everything is fixed. Not a star can move—no living thing can breathe—indeed there is no life. Motion, then, is a necessary mode of thought in our consideration of matter as we know it, except in that instant which we call "*now*," and which is no sooner before the mind than it is gone. The present participle of the active verb is in strict logic a solecism. It is the confusion of two ideas. We say in common language "the boat is moving." This though a convenient form of speech, sufficiently intelligible for purposes of ordinary communication, is somewhat of a mistake. The boat *is*, i.e., it is present to the eye and the mind as an object in space. But to say *it is moving* is to declare that it occupies at one moment two points in space. But "it has moved and is about to move" is a correct ex-

pression; for in this change of formula we have introduced the element of time which was previously excluded; and the expression implies that the boat is not where it was, and that it was not where it is, and that it will be where it is not. We denote the past and the future as well as the present.

You remember the old sophism of Diodorus:—"If matter moves it is either in the place where it is, or in the place where it is not. But it cannot move in the place where it is, and certainly not in the place in which it is not; consequently, it cannot move at all." The fallacy consists in this, that time is excluded from the argument, though it must be involved in any definition of motion. To change place, involves succession, for it is *to be* where it *was* not. It cannot move where it is, because *is* implies space without time, and of course it cannot move where it is not; but let time, that is, the experience of duration come in, and motion may be predicated.

Change, motion, flux, succession, are essential facts of the universe as contemplated by man. But of the Divine mind, the ineffable *I AM*, a great old writer has said, "He only *is*. All others have been and shall be; but in eternity there is no distinction of tenses: * * * those continued instances of time which flow into a thousand years make not to Him one moment; what to us is to come, to His eternity is present, His whole duration being but one permanent point, without succession, parts, flux, or division."*

But to return from this digression. If motion be an essential constituent of our idea of matter, and if the forces which either make or actuate all the great phenomena of the world are modes of motion, then the generalizations of our day which tend to show, if not their identity, yet that they are mutually convertible, are approaches towards that simplification of cause and unity of plan which has ever been the highest aim of philosophy, not only in our own age, but also in those far-off times when Parmenides discoursed on the mysterious One—ἕν τὰ πάντα—One is all, and all are one.

In modern speculations on the organic world there is the same tendency of thought. The laws of organization have been reduced to considerable simplicity in the discovery of homologous anatomical elements, and of cellular growth as fundamental alike to the vegetable and to the animal kingdoms. How far the hypothesis which recently has attracted so much attention and has been supported with so much

* Religio Medici.

ingenuity, and which would reduce the multitudinous species, hitherto held to be eternally diverse, into a few types from which through countless ages there have been series of transmutations and evolutions, eventuating in the present aspects of nature, and seeming endless variety of animated forms ;—to what extent that hypothesis will prove to be a satisfactory clue for re-investigating and traversing the old canons of specific distinctions, it remains for our great naturalists to instruct us. But in the meantime some of the most eminent, for examples Owen, and Agassiz, have condemned it ; while others of equal authority in their departments, for examples Lyell, Hooker, and Carpenter, have treated it with a degree of respect sufficient to warn persons of less knowledge and experience, that Mr. Darwin's suggestions are not to be at once thrown aside, because apparently subversive of what has been hitherto considered to be most stable in the philosophy of the animated world.

For the sake of investing with some faint appearance of completeness in design, what must necessarily from our limits be so very incomplete and desultory in execution, we ought to notice, however briefly, the progress of Literature during the last ten years. Perhaps the most obvious fact is that during the period no new name has arisen, which we can connect with new lines of thought,—such for instance as we refer to the Arnolds and Carlyles of former decades ; for as yet we do not know how far the originality of Mr. Buckle will be sustained. Nor has there arisen any one great writer remarkable for the combination of thought, and knowledge, and eloquence, to the degree that marked the Southeys, and Scotts, and Macaulays of earlier periods. Indeed we have to number up our losses rather than our gains. Almost within a year we have lost Hallam, one of the most learned of historians, as he was the most rigorously accurate in statement, and the most even-handed in the distribution of praise and blame ; De Quincey, with his enormous stores of various knowledge, his exquisite fineness of discrimination, and his marvellous power of uttering impassioned rhythmic prose ; Macaulay, statesman, orator, poet, and historian, who pronounced orations that satisfied the taste of the most fastidious assembly in the world, composed lyrics by which the heart of Sir Philip Sidney would have been "moved more than by the sound of a trumpet," wrote unrivalled essays, and then relinquished all other avocations in order to devote himself to a history, which has proved to be as full of facts and information as if it had

been the dryest of chronicles, as broad and careful in its inductions as if it had been a philosophical treatise, and as artistic and fascinating as if it had been a work of poetic fiction; Mure, the erudite critic, and eloquent historian of Grecian literature; Napier, who added the renown of a great writer to the many other glories of his illustrious race; and quite recently we have had to mourn for one whose removal, while it is a privation to the literature of the world, is felt particularly by the two allied countries, our own and Prussia, to which his name almost equally belongs,—the Baron Von Bunsen. Under a colossal intellect, which was arrayed in learning of proportionate dimensions and magnificence, he bore a heart that not only throbbed with the tenderest human affections, but also beat with the warmest reverential love to God. Of his many noble qualities, one of the most marked was his ardour for truth, and his courage in asserting and practising the liberty of thought, and what our fathers called "the liberty of prophesying." If the light which he held up chanced to dazzle or scare the eyes that had not been trained to look at it, he did not feel called upon to hide what he believed to be "light from heaven,"—a light which had guided his daily life, and which shone upon his dying hours. Perhaps the eyesight of coming ages will be less sensitive; —but certainly it would appear that new light has always been too strong for the times in which it first appeared, even from the days of St. Paul and of Luther down to our own era.

But while reckoning up our bereavements, let us not be ungrateful in our regrets. We have still with us the authors of two noble histories, worthy of our literature, rich as it is in this department,— Grote's History of Greece, and Milman's Latin Christianity. We have also much in prospect, as well as in possession, from the learned Merivale, the brilliant Froude, the graphic Stanley, the fervid Kingsley, and the many-sided genius of Gladstone. And there are great masters and teachers of reasoning still in full vigour, although their course began long before the period which we have been reviewing, conspicuous among whom are Mr. Mill and Dr. Whewell. And there are eminent writers on pure psychology, particularly Mr. Morell, Professor Ferriar, Professor Mansel, and Mr. Bain; also on psychology in relation to physiology, among the most distinguished of whom we may name Dr. Carpenter, Sir Henry Holland, Dr. Laycock, and Sir Benjamin Brodie. Writers of great celebrity have appeared during the decade in various departments of theological literature,—some

distinguished by profound thought, others by extensive erudition, others by their eloquence, others by their power of popular exposition, and others, in addition to their learning and acumen, by determination in maintaining old, or bravery in proclaiming new forms of truth; need we instance the names of the Rev. F. Maurice, Professor Jowett, Professor Mansel, Dr. Guthrie, Dr. Cumming, the Deans of Canterbury, Bristol, and Chichester, and the Bishops of Oxford and St. David's? Their speculations and researches cannot be brought, even if I had the time or qualifications, which I have not, for introducing them, into the serene and somewhat secular atmosphere of our Institution; for they are either of too solemn a nature, or they have been too much mingled with controversies which have agitated and will continue to agitate the world, so long as human minds are divisible into the two great classes of Conservatives and Reformatives.

What may have been produced of late in the Belles Lettres I cannot venture to recount, not having been often allowed to set foot in that flowery empire. But this I think I know, that the beginning and the close of our decade were marked by gifts from the Laureate which would adorn the brightest age in the literary history of any nation, whether ancient or modern. Surely no elegiac poems in any tongue can vie in depth of thought, in compass of imagination, in pathos of sentiment, and in subtle beauty of music, with "In Memoriam;" and if we wish to find any blank verse poem that will bear comparison with the "Idylls of the King," it is necessary to travel far back in our literature till we arrive at the latter third of the seventeenth century. And then, indeed, within hearing of the seraph voice of Milton we are compelled to believe that there never yet have sounded, and probably never will sound again to mortal ears, words of like lofty import, set to like full and solemn harmonies.

But perhaps the most striking fact in the literary history of the last ten years has been the enormous extension, and corresponding importance and influence of Periodical Literature. Almost beyond computation have grown our quarterlies, monthlies, weeklies, and dailies. What does this fact portend? What does it indicate for the interest of letters, for the interest of the profession of letters, and for the general interests of mankind? Whatever answer may be given to these questions, it is obvious that there must be an immense increase of readers; readers too eager to wait for heavy books, or too poor to buy them, or too weak to handle them, or too busy to study them.

Publishers, we have heard, have official readers attached to their establishments. Periodical authors often bear a like relation to the public. They read for the idle, for the busy, for the intelligent, and for the stupid. And even more than this, in a large number of instances they think for the public. Happy then is it for us that they number among them some of the finest intellects of the time,—or rather it is because they are such that we rely so much upon them. Their works are to our minds what the herbivora are to our bodies. These range many a rich and spacious pasture, and compound the vegetable principles into others, which fixed in their frames become our support and nourishment, and at much less cost to our digestive time and labour, than if we ourselves were obliged to distil the herbs, "and crop the flowery food." Whether the faculties of readers are strengthened by having their reading made so easy might be open to debate; but be this as it may, we find daily upon our tables essays which, had they appeared in the *Spectators*, or *Ramblers*, or *Tatlers* of last century, would have been the talk of the town. Every day some rising genius is beginning in this sphere a life of successful energy, or some writer of established reputation is taking a part in its labours; for it is the tendency of this periodical system to draw the fixed stars into the orbits of the revolving planetaries. Let us hope that the increasing light will make us better as well as brighter.

If I could venture to say but little of the Belles Lettres, I can scarcely say more of the Beaux Arts. But I cannot forbear remarking that there has been during the last ten years a more widely-spread taste for the fine arts, together with a more intelligent appreciation of them, than in any previous period of our history. This is presented to our observation in society; but it is also, I am told, made manifest by the demand for works on the literature of art, and for journals devoted to it. What may have been the progress of the arts themselves is matter for other consideration. All will, I presume, admit that the architecture of ecclesiastical buildings has made great strides. Whether secular architecture has advanced at an equal pace I am not qualified to judge. Sculpture may be presumed to be not more than stationary, even if it be allowed that recent sculptors can rival the Bailys, the Westmacotts, and the Gibsons of former decades. What is to be said of painting? A reply to this question would require more time and far more knowledge than I can command, and it might plunge us at once into controversies. Let us be content with remarking

that the prevalence of realism and naturalism is obvious to the most superficial observer. How far this tendency has on the one side done good by promoting a faithful study and imitation of the objective world, and how far it has on the other side run into affectation, into a puerile or archaic simplicity, a conscientious pursuit of ugliness, and a fanatical contempt of beauty, I can no more undertake to determine, than I can judge to what degree the unquestioned benefits conferred on art by the illustrations or denunciations of Mr. Ruskin, atone for the hastiness and irreverence of his judgments, the arrogance of his criticism, and the vices, though they are often *splendida vitia*, of his style. But it is, I know, the opinion of those who have most understanding in these matters, that he has been the author of a really advantageous reaction in art. The changes we have seen in our time are natural to human progress,—excessive addiction for a season to great masters and exemplars,—and then a violent revolt against them. A great artist is a man of original genius, who transfuses outward nature with the colour of his own thought and feeling, and then so represents what he sees, that it shall appear under the same aspects to other eyes. The crowd of imitators look at nature with his eyes, and adopt his models and procedures as if they were natural objects and processes, so that at length by convention and tradition his works and methods are authenticated into canonical types and established truths. But in consequence of frequent and imperfect copying, with the variations of addition and subtraction made by strong individualities, the models come at last to be but faint shadows of the original thoughts, and much less do they represent the original outward nature. Then arises the necessity for the revolution which our own times have witnessed, and with it the foundation of a school of *naturalisti*.

In our hasty and superficial glance at the progress of science in the last ten years, I might have noticed the prominence given to those subjects which are familiar to you by the designation of Social Science, and for the promotion of which an important institution has arisen under the auspices of a name with which this century might be inscribed—the century of Brougham. But long before the formation of that institution there had been commenced a work more noble in its aims and more satisfactory in its results, than any that have been achieved or attempted even in this philanthropic age. I refer to the

repression and prevention of juvenile crime by the reformation of the offenders. The most distant and indifferent observer of social progress could scarcely watch without emotion this holy and godlike movement. But it is impossible that it should be contemplated without a glow of enthusiasm by those who, like the majority of this audience, have a local association with Mary Carpenter and Matthew Davenport Hill. I venture to drop the conventional prefixes to these honoured names—names now belonging to no passing phase of manners, or artificial grade of society, but names dear to mankind—names bright with the lustre reflected on them from the brightening destinies of the most pitiable, and hitherto most neglected members of the human family. I cannot attempt to present you with even the barest sketch of what in these last years has been done by those persevering followers of the example of Him, whose sacred and beneficent path was among "publicans and sinners," and who came to call "not the righteous, but sinners to repentance." Better than to wear the greenest wreaths of mere literary fame—better than to sit in the highest seats in the realm—is it to have in the memory, and heart, and conscience, that they were the first to begin, and have been the most constant in carrying on, by intellectual exertion of the highest order, by self-denial, and by living laborious days, and too often laborious nights, a work which has resulted in a marvellous reduction of the numbers of juvenile criminals; and it is obvious that a diminution of juvenile depravity must necessarily bring as its consequence a tenfold diminution of adult misery. Allow me to read to you a short extract from a charge delivered last year by the Recorder of Birmingham :—

"Whatever doubts and difficulties may hang over the question of the diminution of crime in our adult population, although, speaking for myself, I have a firm belief in the truth of *some* diminution, yet we have overwhelming testimony that juvenile criminals are reduced in numbers to an extent which, sanguine as I have always been in the efficacy of preventive and reformatory measures, if well devised and applied with skill and with Christian zeal and perseverance, I never ventured to hope I should live to witness. I will not trouble you with figures, not because they would not amply prove my statement, but because they must challenge your attention almost daily in the public journals; presenting the statistical results in a multiplicity of forms, and redoubling their value by the accordance which will be found throughout the variety of aspects under which the subject is viewed.

But if, indeed, we were altogether unprovided with statistical evidence, the experience of every day would convince us of this great and auspicious fact. Several Reformatories have actually been closed for lack of inmates, although established and conducted by able and earnest philanthropists, whose interest in the work never decayed, and whose trust in the enterprise never grew faint."*

This is true glory; this is the kind of glory to which, above all people, Englishmen should aspire. The world requires it of us. May we not say that God requires it of us? Of political and social advantages no nation has so freely received, therefore none should so freely give. In a somewhat extensive foreign tour, which (thanks to one of the inventions of this age) I was enabled to take, in a brief holiday last autumn, I passed through many lands which had been the scenes of wasting wars,—the fields of famous victories, rife with unnumbered woes, even to the conquerors;—tracts of country along which broken and disheartened hosts had dragged their disastrous retreat;—plains from which miserable peasants had fled in terror, leaving their homes and all that had made life enjoyable or endurable, to be plundered and ravaged by an infuriated soldiery;—towns and cities which had suffered all the fright and suspense of siege, and the atrocities and unspeakable horrors of storm and sack; many within the last century; and, when I thought of my own dear country, and for how long a period it had been spared such calamities, not merely by the valour of our naval and military heroes, but mostly by that arrangement of Providence which cast our lot in an island, I could not but feel that in this setting us apart as an insulated people, exempt from the casualties which must ever belong to continental territory—in this all-but favouritism of our fortunes—we have incurred a heavy responsibility to the rest of Europe. In this safety and retirement all works of peace should flourish—all science, philosophy, literature, and art should culminate—all that tends, in the immortal words of Bacon, "to the glory of the Creator, and to the relief of man's estate." Here should be tried the highest and most refined experiments in the conduct of government, for the health, the wealth, and the happiness of peoples. All political organisation, all political economy, all civil and municipal arrangements, all attempts to combine the good of the many with that of the few, should here find their fullest and freeest development-

* The efforts most comparable to these in benevolence have been those of Dr. Conolly, the enlightened reformer of the treatment of the insane.

Here should be the models of hygiéne, or sanitary legislation. Here should arise the most enlightened systems for enabling the benevolences of individual natures to co-operate most effectively towards lightening the burthens of the poorer classes. With her natural advantages England should be the school — the university where mankind might study and graduate in the highest humanities!

It is not enough that the world receives from us examples, such as our armies have presented during the last ten years, of the chivalrous bravery which stormed the batteries of the Alma, rolled back the myriad masses down the ridge of Inkermann, and burst the gates of Delhi; or of the fortitude and endurance which never fainted nor faltered in the tents of Balaklava, in the trenches of Sebastopol, and within the leaguers of Lucknow. Nor is it enough that we make successful demonstration to the world that we so prize our land and its privileges, our laws, our institutions, our liberties, our religion, and our beloved homes, with their sisters and wives and daughters, the purest, the fairest, and the tenderest the world has known,—so that old and young, every man and every boy amongst us, is eager to be made a soldier. This is not enough. This is not all that is required of us. Our wars should be the most righteous and inevitable; our rulers, the most just and enlightened; our senators, the most patriotic and the most free from faction; our public servants, the most faithful; our people, the most submissive to law, the most observant of order; our commerce, the most honest; our education, the most extended, and the best adapted to the wants both of the individual and of the community; the poor of our land, the best cared for both morally and physically; our sick and suffering, the most skilfully and mercifully tended; our hospitals and asylums, the largest; our prisons, the smallest; our courts of law, the most easy to enter, the most easy to leave; our churches and chapels, the most crowded with worshippers, and the most clear of superstition. In short, it is our duty to show the nations of the world that we are not only brave and unconquerable, but that we are also and pre-eminently, a wise, a virtuous, a humane, and, in a word, what has scarcely yet been seen, a consistently Christian people.

KNOWLEDGE.

An Introductory Address delivered at the Bristol Athenæum, October 5, 1846.

WHAT is knowledge? How is it obtained? What are its principal divisions? In what spirit should it be pursued?

Whatever has entered from without into the mind of man, and can be recalled by him, and whatever results from the internal workings of his mind and can be communicated to another, is knowledge. Thus Memory enters into, and is essential to, the very simplest form of knowledge; and therefore the Greeks might well fable that the Muses, the imaginary inspirers of the different departments of knowledge, were daughters of Mnemosyne, or Memory. The most elementary sensation, when *remembered*, may be a portion of knowledge, though it is not such when it is merely perceived. For example, you smell a flower; your experience of the sensation is not entitled to the designation of knowledge, unless, when the sensation recurs, you can identify it. In order that it may be said truly that you *know* the scent, it is not needful that you should have the power of reproducing it, as you do with an impression made on the organ of sight. You, perhaps, say, "I cannot recall, or reproduce it, but I should *know* it, if it were again presented to me,"—that is, you would remember that you had once experienced a precisely similar sensation. In like manner we often say, "I cannot recollect the name or the face of an individual, but I should *know it*, were I again to hear or see it,"—that is, "I should remember I had seen or heard it." This is the most simple of all kinds of knowledge. But our sensations are some-

times so distinctly remembered that we can describe them to others, so as to produce in their minds impressions of the same nature, but fainter in degree;—this is a higher step in knowledge. A traveller visits new countries; he sees and hears many new things; and all, or much, of what he has seen and heard he can tell to others, and to them those lands are no longer unknown. But what he tells may in the minds of his listeners engender far greater knowledge than what the traveller himself possesses, for reasons which we shall see directly.

There is a simple knowledge of a thing, and there is a scientific knowledge of it;—a knowledgeable knowledge,—that is, knowledge added to knowledge. A rustic walks with his son to the sea-shore, and points out to him a steam-boat. He knows it to be of that kind of vessels, though to the son it is altogether a new phenomenon. The father had the knowledge which the son had not; but it may be the mere knowledge that it is a ship without sails, and is called a steam-boat. But they are joined by a third person, who can tell how the vessel is impelled in opposition to wind and tide; he knows the properties of steam, the construction of machinery, &c.,—he has a scientific knowledge of the steamer.

This higher kind of knowledge consists in knowing things in their relations or connections. And the instinctive desire to know, is often a craving for the ascertainment of these relations. To a person blessed with reason it is almost impossible to observe a thing, or hear of an event, without wishing to have such information about it as will connect it with something previously in his mind. Strange to say, the more slender his stock of knowledge, the more easily is he satisfied. A peasant picks up a fragment of a fossil animal. He sees that it differs from ordinary pieces of stone, and wishes to know more about it. If he is told that it is a piece of a petrified animal he is satisfied. But let it be shown to a naturalist, and he is unhappy till he has made out what sort of animal it belonged to; a mammal, or a bird, or a reptile, or a fish; if a reptile, whether of the order of turtles, or lizards, or serpents, or frogs; if a turtle, whether a sea turtle or a land turtle, and so on. The larger the mass of knowledge, the greater are its augmentations, while it is in progress; just as the rolling snow-ball takes up an amount of snow proportionate to its dimensions; or, to use a more scientific comparison, just as the force of attraction is stronger in large masses of matter, so a great collection of knowledge draws more to itself.

Now, what are the *relations* or connections of things? The shortest expression would be, that they are comprised in the answers to those interrogative monosyllables. *What? How? Why?* But we must consider them rather more fully. The first and most natural, or I should rather say, the most easily perceived relation, is the *likeness* of things. Great satisfaction is enjoyed in finding out similitudes, and a very large share of the acquirements of childhood depend on this relation. Upon this also is founded the scientific classification of objects. In proportion to the previous knowledge of objects, will the possessor of it be likely to discern likenesses for things newly perceived. An uninstructed person discovers a new plant, which he describes to a botanist; the latter immediately recognizes its similarity to certain other plants, and he may be able to tell at once whether it is a fit article of food or a poison.

Similarity must be carefully distinguished from *Analogy*, which is often confounded with it, but which consists not in likeness of objects, but in likeness of their *relations*. There is no similarity between a ship and a bird, but there is an analogy; for as the bird is moved through the air by the mutual action and re-action of its wings and the air, so is the ship, by a similar relation between the air and its sails. There is no resemblance between the leaf of a plant and the lungs of an animal; but there is an analogy, because they bear similar relations to the organic systems to which they respectively belong. The perception and investigation of analogies has often been the product of the highest exertions of the human intellect. From this process sprang the Philosophical Anatomy of the present age; and to it we owe the immortal work of Bishop Butler, which is so well characterized in the words inscribed on his monument in our Cathedral, by Southey: "Others had established the historical and prophetical grounds of the Christian religion, and that sure testimony of truth which is found in its perfect adaptation to the heart of man. It was reserved for him to develope its analogy to the Constitution and Course of Nature; and, laying his strong foundations in the depth of that great argument, there to construct another and irrefragable proof; thus rendering Philosophy subservient to Faith, and finding in outward and visible things the type and evidence of those within the veil."

Another relation in which things are known is that of *Cause* and *Effect;* a relation belonging to the highest departments of philosophy, both speculative and practical. How things act, or are acted upon by

others, comprises a large enumeration of properties. The discernment of this relation results from an innate tendency of the intellect. The dullest and least inquisitive of minds can rarely refrain from seeking it, in some such questions as, "How came the event to pass?" "What produced it?" &c. The universality and strength of this propensity of the mind would suggest to us its connection with the practical matters of human life, even if we did not know, as we well do, that the operations of man are founded upon it, and that with it are associated those most cogent of motives, Hope and Fear. The untutored savage hears a sound that gives him pleasure; he must find out what caused the sound; for he hopes to ensure its repetition. He awakes from sleep with a sensation of pain in one of his limbs; he must ascertain the cause, to prevent its recurrence. Philosophers have proved that the relation of cause and effect is nothing more than invariable antecedence and sequence; that is, that a cause is something which invariably happens in point of time *before* that which is called the effect; and the effect is that which never happens without having been preceded by what is designated the cause. Moreover, the cause is *strictly* not only the invariable, but also the *immediate*, antecedent. Causes, however, are often spoken of more loosely. Thus, an event may be said to have had several different causes; by which are meant several *remote* antecedents; but it can have but one proximate or immediate antecedent. Some gunpowder has exploded. What caused the explosion? It might have been occasioned by the application of a taper, or a red-hot iron, or the concentration of the sun's rays by a lens, or the passing of an electric spark. There may have been *many* causes, then, but only in the sense of remote antecedents; for there was one event which intervened between them all and the effect, and that was the elevation of the powder to a certain degree of temperature, whereupon the particles suddenly assumed a gaseous form, and so constituted the explosion.

Much confusion in the use of the word "Cause" has arisen from the old Aristotelian division of causes into the material, the formal, the efficient, and the final. To understand this division, you must bear in mind that causes (*αἴτιαι*) were not what we now mean by the term; that is, agents antecedent to, or productive of, certain things or events; but they were the reasons for a thing being what it is. The material and the formal causes can only be apprehended after a knowledge of the ancient theory respecting matter and form; namely, that *matter*

was the imaginary substratum of all things, but entirely devoid of properties of any kind; that *form* was that which, when superinduced upon matter, endowed it with properties, and converted it into *substance*. Substance, then, in this view, was the offspring begotten of form on matter, and hence the fanciful supposition of material and formal causes or reasons. The *efficient* cause was what we now understand by a cause. The *final* cause was the purpose to be accomplished by the thing of which it was predicated. The use of a thing is certainly a reason for its existence, but it does not suggest how it came into existence; except that, from the use we infer a mind that contrived it, and thus arrive at an *efficient* cause.

The third relation requires only a passing notice. It is that of Composition, or the relation between *parts*, whether integral, or constituent. As to the latter, Can the thing be decomposed into different substances or elements? As to the former, Does the arrangement of the parts, in reference to the whole, induce us to place it in the organic, or in the inorganic kingdom?

Under a fourth relation may be placed Quantity and Proportion, or relative magnitude and relative number. The sciences founded on this relation are called the Exact Sciences, and belong to Mathematics. The truths involved in them are said to be *necessary*, as distinguished from those which are *contingent*. The former are said to be necessary, because the mind cannot conceive their opposites; such, for instance, as the statements, "that two lines cannot inclose a space;" and "that two sides of a triangle are together greater than the third side;" while the declaration that "all birds are oviparous," is a contingent truth; that is, it is true till an exception is found, which is conceivable, though not probable. I must warn you, however, that philosophers are by no means agreed upon this distinction. Mr. John Stuart Mill, the profoundest writer of the day on subjects of this nature, adduces cogent reasons for believing that even mathemetical truths are derived from experience, and are not founded on our incapability of conceiving them otherwise than as they are. For the analysis of these truths I refer you to his masterly treatise on Logic.

Having thus noticed the relations in which things are known, we must next turn our attention to the processes whereby we acquire knowledge. These are, Observation and Reasoning.

Observation may be defined as the active and disciplined use of our senses. Small, indeed, is the scientific knowledge obtained by merely passively seeing and hearing and feeling. We must look and listen, and touch and handle, and weigh and measure, and register, if we hope to make any important discoveries. The senses are said to be the windows through which the mind takes cognizance of the universe. But if the mind lies dormant in its prison-house, faint will be the light, and few the images of outward objects, that reach it through those narrow port-holes. It must arouse itself and look out and devise all manner of helps and instruments for improving its perception, and bringing objects more nearly within its ken; and then the fleshly tenement is no longer a darksome cell; it has become a glorious observatory, from which the soul may gaze into the starry Infinite.

But the senses must not only be active; they must also be instructed and disciplined. There is the "*tactus eruditus*," the learned touch, the learned sight, and the learned hearing; learned in two meanings,—one having reference to the accumulated knowledge which throws light on the present objects of perception, so as to make them reveal what would be withheld from a less intelligent observer; in the other signification, experienced as to the exercise of the organ; for example, being able by practice to detect fallacies, to distinguish spectra from actual objects.

Lastly, the senses must be unbiassed. If true observations are to be made, there must be no prejudices, no coloured media to bedim or distort the light.

It is not, however, always sufficient to set our senses to work on the objects, just as the latter are presented to us. We must alter their position, see them under new lights, and in unaccustomed environments. Things that seemed like may then be found to be vastly different. By withdrawing one of a series of events, or of a congeries of substances, we ascertain what was necessary in causation, or essential in composition. We, in fact, add *experiment* to observation. Harvey puts a ligature on an artery or a vein, and, by the direction of the obstruction finds the current of the blood; and Davy makes his potent galvanic battery tear asunder the potassium and oxygen, which under a *tertium quid* had effectually concealed themselves from former investigators.

The other method of acquiring knowledge is Reasoning, or Inference, whereby the mind proceeds from the known to the unknown.

Reasoning did not originally mean mere inference. It was the discerning of those relations of things which we have already noticed, and it corresponded to the word Discourse, derived from the Latin *discurrere*, to run over, to traverse objects. It was used in this signification by Hamlet:

> "Sure He that hath made us with such large *discourse*,
> Looking before and after, gave us not
> That capability and god-like *reason*,
> To rust in us unused."

But Reasoning in the present day means Inference, or drawing conclusions, or making the knowledge we already possess lead our minds to the knowledge of something new. When the train of reasoning which has convinced an individual of some truth, is presented by him in a form designed to impress the same truths on another, it is called an *argument*. Reasoning is of two kinds, Ratiocination and Induction. The former, which may also be called Deduction, consists in shewing that if such and such pieces of information are received as true, certain others deducible from them must also be true. It is reasoning from generals to particulars; for the conclusion is a limited truth now proved to be inclosed in a more comprehensive one already admitted. The formal exhibition of this process is a Syllogism. It consists of three propositions, the third being proved by a comparison of the first and second. I need not go into the technicalities of the major and minor terms and premisses, as you will find them fully set forth in common books of Logic. The syllogistic method has often been misused for the purposes of mere verbal controversy, and the almost exclusive attention to the truths ascertained by means of it, for some centuries prior to the time of Lord Bacon, no doubt impeded the progress of knowledge. But the judicious use of it, even in its most technical form, imparts a habit of close scrutiny into the meanings of words, and into the import of propositions. In its more enlarged scope, or that of Deductive Reasoning, it is a most important process of *evolving* minor principles; *minor* in one sense, though of high practical value, and wrapped up in greater ones. Ratiocination, then, is not merely "chopping logic;" that is, formally stating the major and minor premisses, and then dragging in the priggish, pedantic "*ergo*." Great discoverers have promulgated principles, the important deductions from which were not thought of by themselves; and minds of the most exalted powers have been employed in deducing truths from the

wide embracing principles previously laid down. The whole science of Geometry lies enfolded, as it were, in what are called the Axioms and Definitions; but to unroll these cerements, and to disclose the body of doctrine they contain, has given work to the most skilful and capacious intellects in many successive ages.

The other process of reasoning is Induction; or, the inferring of general truths from particular facts,—reasoning from particulars to generals. We infer that what has been found true of a number of individuals will apply to other like individuals. We ascertain from a sufficient number of instances that animals with teeth of a certain form feed on a certain kind of food, and have a certain arrangement of the digestive apparatus. When we meet with a new animal having teeth which resemble those of the class described, we anticipate that it will require corresponding food. And so as to the investigation of cause and effect. If in an adequate number of cases the succession has been observed, we confidently infer a recurrence of the sequence. Lavoisier, having classed under the name Acids those substances which resemble each other in the property of reddening vegetable blues, and of forming neutral salts with earthy or metallic oxides, found by repeated observations and trials, that these several substances, however varying in composition in other respects, all contained oxygen; whence he thought himself warranted in concluding that oxygen was the acidifying agent, and he anticipated that in every acid that element would be detected. This was a specimen of Induction apparently sound enough at the time it was formed. But examples of Acids have been since discovered, devoid of the element in question, and therefore the generalisation could not be retained.

To illustrate the necessity of an abundance of instances in reasoning by Induction, I must read you the following amusing quotation from Mr. Macaulay's Essay on Lord Bacon:—

"Though every body," he observes, "is constantly performing the process described in the second book of the *Novum Organum*, some men perform it well, and some men perform it ill. Some are led by it to truth, and some to error. It led Franklin to discover the nature of Lightning. It led thousands who had less brains than Franklin to believe in Animal Magnetism. But this was not because Franklin went through the process described by Bacon, and the dupes of Mesmer through a different process. * * * We have heard that an eminent Judge of the last generation was in the habit of jocosely pro-

pounding after dinner a theory, that the cause of Jacobinism was the practice of bearing three names. He quoted on the one side, Charles James Fox, Richard Brinsley Sheridan, John Horne Tooke, John Philpot Curran, Samuel Taylor Coleridge, Theobald Wolfe Tone. These were *instantiæ convenientes.* He then proceeded to cite instances *absentiæ in proximo.*—William Pitt, John Scott, William Windham, Samuel Horsley, Henry Dundas, Edmund Burke. He might have gone on to *instantiæ secundum magis et minus.* The practice of giving children three names is more common in America than in England. In England we still have a King and a House of Lords; but the Americans are Republicans. The rejections are obvious. Burke and Theobald Wolfe Tone, were both Irishmen; therefore the being an Irishman is not the cause of Jacobinism. Horsley and Horne Tooke, are both Clergymen; therefore the being a Clergyman is not the cause of Jacobinism. Fox and Windham were both educated at Oxford; therefore the being educated at Oxford is not the cause of Jacobinism. Pitt and Horne Tooke were both educated at Cambridge; therefore the being educated at Cambridge is not the cause of Jacobinism. In this way our inductive philosopher arrives at what Bacon calls the *vintage*, and pronounces the having three names is the cause of Jacobinism. Here is an induction corresponding with Bacon's analysis, and ending in a monstrous absurdity. In what, then, does this induction differ from the induction which leads us to the conclusion, that the presence of the Sun is the cause of our having more light by day than by night? The difference evidently is, not in the kind of instances, but in the number of instances; that is to say, the difference is not in that part of the process for which Bacon has given precise rules, but in a circumstance for which no precise rule can possibly be given. If the learned author of the theory about Jacobinism had enlarged either of his tables a little his system would have been destroyed. The names of Tom Payne and William Windham Grenville would have been sufficient to do the work."

Before quitting the subject of Reasoning, I must observe that Archbishop Whateley and others aver that every train of reasoning, even the Inductive, may be put into a syllogistic form; but it is also maintained that the conclusion is contained in the major premiss; and therefore it has been urged by others that if these views be correct, there an be no progression in Reasoning, no advance into new knowledge, if the process only tells us what we have already stated by

implication in the major premiss. Mr. Mill, however, has taken pains to shew that Induction is really reasoning from *particulars* to *particulars*, and not, as in the syllogism, from generals to particulars. He says, by way of illustration, that if you choose you may deduce the mortality of the Duke of Wellington, *according* to the common formula;

All men are mortal;
The Duke of Wellington is a man;
Therefore the Duke of Wellington is mortal.

But the major premiss is merely a register or commemorative statement of our experience as to a number of individuals, and of our inferences as to other like individuals. The mortality of William is inferred from that of John and Thomas, and that of the Duke of Wellington is inferred in the same way. That is, we anticipate that what has happened to a vast number of individuals bearing the attributes of humanity will happen also to the Duke. "That all men are mortal," then, is a register or note of our inferences as to individual men, and the conclusion as to the mortality of the Duke is not an inference from that statement, but a *reference* to it, or, to quote Mr. Mill's own words;—"All inference is from particulars to particulars; general propositions are merely registers of such inferences already made, and short formulæ for making more; the major premiss of a syllogism consequently is a formula of this description; and the conclusion is not an inference drawn *from* the formula, but an inference drawn *according to* the formula; the real logical antecedent, or premisses, being the particular facts from which the general proposition was collected by induction."—*Mill's Logic*, Vol. 1, p. 259.

But without going further into these interesting points, I may hint to you, that, after all, the value of the syllogism is not to be sought in the conclusion, but in the juxtaposition of the premisses. When these are brought together, any simpleton can draw the inference. And, indeed, the merit of *any* new train of reasoning, whether inductive or syllogistic, consists in the bringing together, for the first time, things which had not been previously so associated. Reasoning, then, is essentially, and freed from technicalities, neither more nor less than what plain people speak of, as *putting things together* in a way that will suggest to the mind some new information or conclusion.*

* In connection with this subject I beg to refer the reader to an excellent little work, entitled, "Lectures on Logic, &c., delivered at Bristol College by Francis W. Newman, Esq., late Fellow of Balliol College, Oxford, 1838."

We now proceed to the classification of Knowledge. The illustrious Bacon distributed Learning or Knowledge, according to the three principal faculties of the mind, to wit,—*Memory*, *Imagination*, and *Reason*, correspondently with which the three principal divisions are, History, Poesy, and Philosophy. But, with all our reverence for whatever has proceeded from so exalted an intellect as that of Lord Bacon, we cannot but perceive that this arrangement is very defective. There are no departments that belong by any means exclusively to any one of those faculties. History involves not only the records of Memory, but also the operations of Reason in judging, comparing, and inferring. Philosophy again cannot be prosecuted by Reason, without the aid of Memory; and Poesy requires Memory and Reason, scarcely less than its peculiar instrument, Imagination. Nevertheless, these faculties may still be considered the types of the mental operations respectively performed in these several departments. But other difficulties are afterwards encountered. In many sciences, we cannot separate the commemorative from the speculative or reasoning part. The very method which Lord Bacon himself so strongly urged for studying nature, when carried out, introduces us to knowledge, which cannot be divided in accordance with his arrangement, although it appeared to suit the condition of learning in general, and of philosophy in particular, at the time that he produced his memorable work on the Advancement of Learning.

After these remarks it may appear very presumptuous in me to offer the following scheme; but I do so with great humility. I must first, however, advert to the old division of knowledge, into Sciences and Arts. Most of our knowledge began with Arts,—the first attempts at subjugating matter and its forces to the will of man. In the prosecution of these arts, knowledge was accumulated; and in time, the principles on which the arts are founded, began to be separated from the processes themselves. Afterwards the assistance becomes reciprocal. What Science had borrowed from Art, she now repays with interest, by indicating that the purposes of Art may be more securely and successfully accomplished by attention to certain principles. Most Arts, then, have their correlative Sciences, and most Sciences their correlative Arts. The Arts are divisible into the Useful and the Fine Arts. The Fine are those which minister to our sense of the Beautiful, *viz.*:—Poetry, Painting, Sculpture, and Music. The Useful Arts extend from the simplest handicrafts, to those exquisite

OBJECTS OF KNOWLEDGE

INORGANIC.

		SCIENCES.	ARTS.
Phenomena	Astronomy		Navigation.
	Geography		Navigation.
	Geology		Mining Operations. Agriculture.
	Mineralogy		Mining Operations. Agriculture.
	Meteorology		Medicine.
Forces	Mechanics		Useful and Manufacturing Arts.
	Hydraulics		Useful and Manufacturing Arts.
	Hydrostatics		Useful and Manufacturing Arts.
	Pneumatics		Useful and Manufacturing Arts.
	Optics		Useful and Manufacturing Arts.
	Acoustics		Useful and Manufacturing Arts.
	Electro-Magnetism		Useful and Manufacturing Arts.
Composition	Chemistry		Useful and Manufacturing Arts.
Relations of Magnitude and Number	Mathematics	Geometry	Useful and Manufacturing Arts.
		Arithmetic	Useful and Manufacturing Arts.
		Algebra	Useful and Manufacturing Arts.
		The Higher Calculi	Useful and Manufacturing Arts.

ORGANIC.

			SCIENCES.	ARTS.
Vegetables	Classification		Botany	Agriculture. Horticulture. Medicine.
	Structure		Anatomy	Agriculture. Horticulture. Medicine.
	Function		Physiology	Agriculture. Horticulture. Medicine.
Animals	Classification		Zoology	Breeding of Animals. Veterinary Medicine.
	Structure		Comparative Anatomy	Breeding of Animals. Veterinary Medicine.
	Function		Comparative Physiology	Breeding of Animals. Veterinary Medicine.
Man	Species	Body	Structure — Human Anatomy	Hygiène. Medicine. Surgery.
			Function — Human Physiology	Hygiène. Medicine. Surgery.
		Mind	Morals, Intellect — Speculative Philosophy, or Metaphysics	Education. Logic. Politics.
			Æsthetics	Poetry. Fine Arts.
			Language — Grammar	Rhetoric. Elocution.
			Language — Philology	Rhetoric. Elocution.
	Races		Ethnography.	
	Nations		History and Antiquities.	
	Individuals		Biography.	

GOD.

- Natural Theology.
- Revelation.

and complicated inventions, which have been brought to so high a pitch of excellence in the present day, by help of Mechanical Science.

In the Table, you perceive that I have distributed the Sciences in the first place with reference to *Objects* of Knowledge, in either of those two grand domains of nature, the Inorganic, and the Organic;—to Man himself who surveys these objects;—and to the Supreme Artificer and Governor of all things.

The Sciences belonging to the Inorganic kingdom, are classified as treating: 1st of the *Phenomena* of objects, and the comprehending (*a*) *Astronomy*, so far as it is occupied with observations on the relative position and motions of the heavenly bodies; (*b*) *Geography*, or observations on the surface of the earth, especially the distribution of land and ocean, of lakes and rivers, of mountains and valleys; (*c*) *Geology*, or observations on the crust of the earth, its rocks and strata, and their organic contents; (*d*) *Mineralogy*, or the components of rocks and strata; (*e*) *Meteorology*, or observations on the atmosphere.

The second subdivision is founded on the Forces of Matter, and includes Sciences which I must content myself with enumerating. They are, Mechanics, Hydraulics, Hydrostatics, Pneumatics, Optics, Acoustics, and Electro-magnetism.

The third subdivision rests upon *Composition*, and the forces or affinities which determine it, and it is occupied by the great name of *Chemistry*,—a science which is every day enlarging its acquisitions and its importance to the human race.

Under the fourth subdivision are arranged those Sciences which treat of the proportions and measurement of matter in space, or Number and Magnitude. They are called Pure Mathematics, and include Geometry, Arithmetic, Algebra, and the higher Calculi.

The Sciences appertaining to the Organic kingdom, are subdivided according as they treat of Vegetables or Animals; and therefore we have, 1st, Botany and Vegetable Anatomy and Physiology; 2nd, Zoology, and Comparative Anatomy and Physiology. The term Comparative, arose from the study of the anatomy of animals as compared with that of man.

Man belongs to the organic kingdom; but for the purposes of our present classification, we may fairly take him out of it, both because he is the only species capable of looking at the kingdom over which he is placed, and also from the great variety of the branches of knowledge of which he is the object. These sciences are, I hope, sufficiently indicated and distinguished in the Scheme.

The fourth general division is devoted to Religion, Natural and Revealed; the knowledge of God's dealings with the world and with man, and man's relations to God, in connection with his present life and future destiny.

I need scarcely remark that all these Sciences are less or more closely connected one with another, and reciprocate much illustration.

It will be convenient in this place to notice one or two popular distinctions. One of these is the separation of Science and Literature. Literature, in its widest sense, embraces all knowledge which has been committed to writing. All recorded observations of nature, and all systems of Philosophy belong to it. But there is a department of Literature unconnected with Natural Science, or Philosophy. It comprehends History (proper), Biography, Antiquities, the Study of Languages, Poetry, Rhetoric, and Imaginative Writing in general, as well as the lighter branches of Philosophy, or those bearing on the Fine Arts. These several topics belong to Literature, *par excellence*. If from the heads I have just enumerated, you subtract History, Antiquities, and Biography, there remain those species of learning which the French denominate Belles Lettres, and which with us are often called Polite or Elegant Literature, or the Literature of Taste, a phrase adopted by Mr. Hallam in his great work on the Literature of Europe.

Another distinction common in men's mouths is that of Physical or Mechanical Science, as separate from Philosophy, *par excellence*,—otherwise called Speculative Philosophy; the former appertaining to objects, the knowledge of which is acquired through the senses; the latter only by consciousness or reflection. To this department the term Metaphysics is often applied.

There is, as you well know, a branch of Literature called Classical. Any work of surpassing excellence is classical, the term having been derived from *classici*, the highest order of Roman citizens. But the name is specially assigned to those wonderful remains of antiquity, derived from the learning of Greece and Rome. The vast superiority of Greece in æsthetical literature as well as in pure philosophy, was confessed by the most accomplished poets and orators of Rome, who made the works of the very people whom they had conquered, their models for imitation. Under the revival of learning which ensued on the Dark Ages, the Greek and Roman writings were eagerly sought and studied, and their character has lost nothing by the flux of time.

"Still green with bays each antient altar stands,
Above the reach of sacrilegious hands;
Secure from flames, from envy's fiercer rage,
Destructive war, and all-involving age.
Hail bards triumphant! born in happier days,—
Immortal heirs of universal praise!
Whose honours with increase of ages grow,
As streams roll down, enlarging as they flow."

If you once more throw your eyes over the Scheme, you will perceive that the Sciences there enumerated, with their correlative Arts, may be thrown into four large groups.

I. The Physical Sciences.

II. The Psychical, or those appertaining to Vegetable and Animal Life.

III. The Speculative.

IV. Literature.

Upon the general character and influence of these several divisions, I shall offer some brief comments. And first, as to the Physical Sciences, I may remark, that setting all other advantages aside, they present a wonderful combination of agencies for calling into exercise the various powers of the mind,—the highest and most comprehensive, —the exactest and most laborious. They have given at once employment and inspiration to some of the greatest intellects the world has ever known:—the Keplers, the Newtons, the Laplaces, and the Herschels, the Lavoisiers, Davys, and Daltons, the Watts, and Stephensons, the Faradays, Oërsteds, and Liebigs. In the pursuit of these Sciences all that in the mind of man is precise in observation, extensive in combination, subtle in analysis, ingenious in application, and beneficial in purpose, may be brought to bear on the objects of his thought, and the work of his hands. In this wide domain were achieved those grand triumphs over matter, which the world owes to the genius of our immortal countryman, Lord Bacon; who pointed out to mankind where lay the secret riches of the universe, unheeded by successive centuries, and locked up, as if by a magic spell, till the fated words burst from his inspired lips;—and then the doors of the cavern flew open, and disclosed priceless treasures which might have been for ever hidden from the admiration and use of mortals, if no such prophet had arisen in our land. But why should I attempt with my feeble words to recount the advantages derived from these wonderful sciences, when prosecuted under the guidance of the

Baconian Philosophy? Rather let me borrow the eloquence of Mr. Macaulay:—

"Ask a follower of Bacon what the New Philosophy (as it was called in the time of Charles II.) has effected for mankind, and his answer is ready. 'It has lengthened life; it has mitigated pain; it has extinguished diseases; it has increased the fertility of the soil; it has given new security to the mariner; it has furnished new arms to the warrior; it has spanned great rivers and estuaries with bridges of form unknown to our fathers; it has guided the thunderbolt innocuously from heaven to earth; it has lighted up the night with the splendour of the day; it has extended the range of the human vision; it has multiplied the power of the human muscles; it has accelerated motion; it has annihilated distance; it has facilitated intercourse, correspondence, all friendly offices, all dispatches of business; it has enabled man to descend to the depths of the sea, to soar into the air, to penetrate securely into the noxious recesses of the earth, to traverse the land on cars which whirl along without horses, and the ocean in ships which sail against the wind. These are but a part of its fruits and of its first fruits. For it is a philosophy which never rests, which has never attained its end, which is never perfect,—its law is progress. A point which yesterday was invisible, is its goal to-day, and will be its starting-post to-morrow.'"*

The second large division, which I designate as the Psychical Sciences, have, like the first, external nature for their object; the wide world of life and organization; a world of infinite variety and beauty. The sweep of these sciences may not be so wide as of those which traverse the paths of planets, or decompound the star-dust of Heaven into myriads of bright worlds far surpassing the magnitude of our globe; nor can it be said that the arts which belong to them have effected any thing like the same degree of subserviency of natural forces to the will of man; but to the contemplation of the philosopher they afford matter for at least equally close investigation and scrutiny; and the study of them is relieved by ever fresh types of beauty and power, and proofs of the all-pervading might and goodness of the Great Father of All. In many of the investigations connected with this department of knowledge, there is a fascination derived from the very mystery which hangs over all the processes of life. You sit under the shade of a wide-spreading oak on a midsummer noonday,

* Edinburgh Review, Vol. 65, p. 82.

when not a leaf stirs in the still air, and you might fancy for a moment that the vast fabric above you was inanimate as the ground on which you rest. But you know that, were your eyes microscopic, and your ears attuned to the more delicate sounds in nature, you might find in every point unceasing work and motion,—fluids rushing hither and hither, nutritive particles laid down, and effete ones carried away; and the "old oak tree" would appear to you as busy a scene, and infinitely better ordered, as the most thickly-peopled of our cities, with their thronged streets and lanes, and their continuous whirl and turmoil. And the pool of water beside you, with its green summer mantle, which presents at first no sign of motion, but an occasional dimpling from the wing of some restless fly on its surface, would to keener senses become populous with life,—shewing multitudes of living beings of strange shapes, disporting themselves in their world as gaily as any of those that in regions more cognizable to us, play in the sunbeam, or frolic on the green sward. Such beautiful surprises may come upon the eye which, aided by the resources of Science and Art, can penetrate the veil which for ages hid these worlds of life from human vision. But grander and ampler views are within the reach of the naturalist. To stand on the elevated ground which Cuvier took, and hear him,—not only, like his great prototype, give names to the various species, but also arrange all the animated beings around him in natural families and nations, technically called genera, and orders, and classes, and kingdoms;—or to see him take up the fragment of a bone belonging to an animal whose generation had passed away long ages before the present dynasty of living creatures, and shew with irrefragable logic how from the harmony of forms and correlation of parts, the animal must have been of such mould and fashion as with his magic pencil he sketches before your eyes; or to hear how the living forms, various as they seem, have been composed upon a very few simpler types, if not indeed upon one plan, the mutations of which have been adapted with marvellous skill to the surrounding conditions of existence;—these are occupations worthy of the largest faculties, the most gifted genius. I have not time even to hint at the many beautiful discoveries of modern times in Human and Comparative Anatomy and Physiology; nor would it be becoming in me, on the present occasion, to dwell upon the immense value of the applications of science to the good of man, which have been derived from the science and art of Medicine. But in surveying the several branches of knowledge belonging to this division, it is impossible to estimate them

too highly, as affording wholesome discipline of the intellectual powers —charming to the sense of the beautiful, and leading to some of the worthiest of purposes; and in connection with them, let me remind you of the names of Hippocrates, Aristotle, Pliny, Harvey, Ray, Cuvier, Hunter and Jenner.

The third group embraces the Speculative Sciences, or Intellectual, Moral, and Æsthetical Philosophy;—knowledge which is not derived so much from without as from within the mind of man;—the workings of his understanding, his emotions and sentiments, and his reasonings upon them. To the whole group the term Psychology is often applied. This branch of knowledge has been doomed to great reverses. At one time, under the august name of Pure Philosophy, it was exalted to an eminence towering above all other sciences. Many of the ancient philosophers carefully separated their Science from any kind of knowledge susceptible of application to the uses of mankind: for it was an indignity that it should be supposed to be capable of ministering to any such vulgar purposes. Seneca speaks very disparagingly of transparent windows, and an apparatus for diffusing heat through buildings; at least, he thinks them all very well in their proper place, but a high-flown philosopher has no concern with such utilitarian inventions. His care is not to tend and comfort the body, but to train and elevate the soul, and so forth. On the other hand, from the barrenness of some of the sciences in this division, the whole group, under the general head of Metaphysics, has often in later times been unduly depreciated. The thoughts have been stigmatized as mystical, and the language as jargon. It has been said to be characterized by everlasting rotation and no progression. If the investigation of such questions as, whether there is any proof of the existence of an external world; whether we are impelled to action by fate or free will; whether pain is an evil; whether it is possible to be certain about anything; if such inquiries constituted the main business of the sciences under this department, we might conscientiously dismiss them with the passing remark that they could serve no good purpose beyond that of sharpening controversial wits. But such is not the case. In analysing the operations of the intellect into certain combinations or series of thoughts, to which are affixed the term *faculties* by one set of philosophers, and *mental states* or *feelings* by another,—you acquire useful knowledge,—you arrange and classify phenomena so that you can better study them separately. To draw a clear distinction between intellectual states and those which are purely emotional, and between these and propensities,

is something gained; and at all events, it is very important as a step towards the ascertainment of the functions of particular portions of the nervous system. To shew the connections between language and elementary functions of the mind, and their reciprocal influence, is, to say the least, a subject of intense interest; and it has very extensive bearings on the origin and affinities of languages, and correspondently of tribes and races. To be satisfied on this point, let any one observe the use made of vast philological as well as psychological knowledge in Dr. Prichard's classical work, entitled "Researches into the Physical History of Man." The enjoyment derived from Poetry and the Fine Arts is greatly enhanced by a knowledge of the principles, by virtue of which the feelings of beauty and sublimity are excited in our minds. If we take the whole group into consideration, I doubt if their value can be over-estimated, as tending to discipline and invigorate the mind by means of hardy and complicated exercises, and to habituate it to exactness of thought and to minute attention to proprieties of language. The ulterior beneficial uses in connection with education, both moral and intellectual, are too obvious to be dwelt upon. And they have this advantage over the Physical Sciences,—that their materials are always with us. The outer world may be veiled from our sight; but by turning inwards the mental eye, we discern in the phenomena of consciousness an abundance of objects for interesting, nay, engrossing occupation. But, lastly, whether these several benefits be considered worthy of attention or not, it cannot be denied that the Speculative Sciences form the subject-matter of some of the finest and most influential writings ever given to the world. Need I, in conclusion, invoke the names of Plato and Aristotle, Cicero and Seneca, Leibnitz and Des Cartes, Hobbes and Malebranche, Lock and Berkeley and Kant, and in our own times, Stewart and Brown, and Cousin and John Stuart Mill?

But I must hasten to the fourth department of knowledge, or Literature. I need not again enumerate the species of knowledge arranged under this head. And it is almost superfluous to make any remarks upon it, excepting by way of completing this hasty and general sketch. The humanizing effect of letters has been the theme of writers in all times, and to expatiate upon it duly would occupy many lectures. But the most striking characteristic of this division of knowledge is, I think, its power of introducing us to an intimate acquaintance and sympathy with the minds and feelings of other men; not but that this effect, in a measure, belongs to some of the other divisions, but it

pre-eminently belongs to that which is under our present consideration. We look at nature as they looked at it,—we feel as they felt when the various great events in the world's history, and changes in the forms of society, passed before them; and it enlarges and yet softens the mind to know how in all ages and climes and peoples, there have been men of like passions and thoughts and sentiments with our own. We are so familiar with the presence of *Books*, that we are liable to forgetfulness of how much we owe them. Let no one tempt you to think disparagingly of books, or scare you with the notion of being turned into book-worms. It is very fine to say, "Be your own book;" or, "Go read the book of Nature; use your own eyes and mind,—in books you see only the reflection of other men's eyes and minds." But this is one of the great points of value in books,—for in them you have matter instinct, informed, impregnated with immortal thought! There may be bad books, as well as bad specimens of any other products of human labour; and there may be repugnant objects in nature itself. Yet we do not turn away from Natural History, because there are such things as nettles and vipers. But forgive me for having in the faintest way hinted at the possibility that the study of books could require an apology. Rather let me congratulate you on the vast facilities afforded in the present day, not only for reading, but also for possessing books, by means of the various enterprising schemes for the diffusion of cheap Literature. In the compass of the smallest chamber you may be independent of the rest of the world, at least for mental gratification. There you may travel over the globe, and see more men and manners than even the long-wandering Ulysses, and without his many sorrows. And there you may listen to all varieties of moving recitals of the fates of families and destinies of empires:—

> "Presenting Thebes and Pelops' line,
> And the tale of Troy divine."

And you will have glimpses of what was passing in the minds of the fathers of our race, when the world was in the freshness of its spring,—when in their beautiful mythologies they speculated on the origin of things around them,—constructing their simple theories of the ever-marvellous phenomena of the universe. And you follow the career of great men and heroes in their indomitable struggles with hard and evil destiny; and you look over memorable battle-fields,—Marathon, Pharsalia, Naseby, and Waterloo,—and your sight may pierce through the cloud and confusion, and discern what all that urmoil with its deadly rage is tending to, better than those who are

periling their lives in it. And you wander about old cities, and they are again populous and stirring with "the hum, the din, the shock of men;" the strife, the business, the pleasure. Yes, the Past is no longer past; the dead ages rise again, and sweep before you, not pale and ghost-like, but in all the actions and characteristics of their many-coloured life! And you are taken to other worlds, and introduced to other beings, created by the imagination of poets; and you find your dearest and most familiar emotions, some that date almost from your cradles, and others that have grown with your growth,—the manliest and the tenderest,—all attuned to lyric strains which revive those feelings in your hearts, not only with all their native force, but also associated with those sentiments of the sublime and the beautiful, over which the minds of bards have such unbounded sway. But it is vain to think of enumerating the pleasures attendant on the pursuit of Literature. We can but observe, that they force us to consider the inestimable value of that gift to man, which in importance yields only to the gift of speech. Well might a recent writer thus apostrophize the letters of Cadmus:—"O eldest-born, and most wonderful of all miraculous inventions! Keys to the riches of the universal mind of man! Symbols of ineffable power! Types of eternal beauty! Seals that bear the impress of all that is potent and touching in thought and feeling! In vain do we search in the inanimate world for figures to represent your manifold attributes! Rather let us impersonate you as angels of light and love, walking over this lower world, and plentifully scattering the gems of wisdom, and the never-fading flowers of eloquence and poetry. You pass from land to land, traversing seas and antient rivers, and telling the dwellers on their shores stories of undying interest. And how clear and distinct are your tones! The hieroglyphs of Egypt do but mumble, and mutter, in sounds as mystical as the doctrines they half hide and half reveal. The picture-writing of Mexico doth but half gesticulate like a half-reasoning savage. But ye, children of Cadmus! your voices are silvery and articulate, and

'Musical as is Apollo's lute.'

By you

'The fountains of divine philosophy
Fly not our thirsting lips, and all of great
Or good or lovely, which the sacred past
In truth or fable consecrates, we feel
And know.'

And the words ye utter are spells to neutralize absence and annul even death. Without you, the bygone glory and beauty of the world would be lost for ever. Men might stand on the Acropolis and the Capitol, without thinking of Pericles and Cæsar; and in the woods of Vaucluse no shade of Laura would hover over the scene. Without you the dead would be dead indeed. But you have caught the words from their eloquent lips, and remembered their fair faces, and dived into their deep thoughts, and treasured up their sweet songs; and as for their mighty deeds, you have emblazoned them in colours which the hand of Time, that dulls and darkens all else, seems ever to brighten and glorify."

But from this ardent apostrophe, we must turn to remind you that the various kinds of knowledge of which we have been speaking belong to Human Knowledge. I have already noticed, and this is not the place to dwell upon, divine knowledge, or the knowledge of divine things. But I trust we all regard this as the culminating point of knowledge, being assured that, as it tells of Him who is the Cause and Source of all knowledge, and of our relations to Him, and also of that life to which the present is but a brief prologue, it must infinitely transcend all other knowledge.

I shall now draw this Address to a close, by offering a very few remarks on the spirit which should animate us in seeking knowledge. The chief motive, it must be allowed, should be the desire of better performing our several duties. Whatever be our station in life, from the lowest to the highest, there are certain duties to which we are especially called; certain engagements which we have expressly or virtually undertaken; and, therefore, be we craftsmen or statesmen, have we trades or professions, are we gentlemen or noblemen,—we have duties to do, and we are bound to strive after the knowledge which will qualify us for the most efficient discharge of them.

> "To know
> That which before us lies in daily life
> Is the prime wisdom. What is more, is fume,
> Or emptiness, or fond impertinence,
> And renders us in things that most concern
> Unpractised, unprepared, and still to seek."

In the second place, we must cultivate knowledge in a spirit of humility and modesty. The learning that puffeth up is false and vain,

and scanty withal. He who knows most, knows best how much remains to be known. He who looks at the realm of knowledge after the first few steps of his ascent up an eminence, sees what he thinks may be easily traversed or compassed, but the higher he ascends, the wider does the horizon become, and he perceives but too plainly that his greatest acquisition can be but a very small part of that which he surveys. Men of the strongest and most richly informed minds have ever been observed to be the most deferential to their fellow-men, and the most reverent. With their largeness of comprehension, they see that there are certain departments of knowledge which must, from the nature of things, be held in more complete possession by others; and in their relation to Infinite Power and Wisdom, they have felt overwhelmed with a sense of their utter insignificance.

In connection with this topic, I would venture to warn you, espepecially, against falling into Pedantry. This term used to be applied specifically to persons who, piquing themselves on their scholarship in the dead languages, were everlastingly obtruding their learning on all companies and at all seasons, not merely from the desire of setting forth their own individual acquirements, but also from an exaggerated estimate of that species of knowledge. But Pedantry is not confined to scholars. It belongs no less to men of science and to professional men; to all, in fact, who, having been exclusive students in one department of information, are therefore (like the Chinese, who have never passed the boundaries of their country) unable to conceive the existence of anything worthy of attention beyond their own domain.

Although, as we have seen, the great purpose in acquiring knowledge is that of fitting us for our several duties, I must urge you to love it for its own sake; love it as one of the best gifts of God; love it as the object which, in the pre-established harmony of the universe, stands in correlation to a susceptibility innate in your minds; love it as you love the friend of your bosom, not because that object of your affection can afford you this or that advantage, or gratification; but because it *is* the object of your affection, and is in itself, and for itself, lovely.

In this imperfect discourse, I have had no thought of enforcing on your minds the claims of knowledge,—for your recognition of them is proved by your support of this useful institution. Permit me, however, before I conclude, to remind the younger members of the Athenæum, that even Knowledge is not the best of all things; that it can but

occupy the second place in relation to Moral Excellence. Knowledge is good, but Virtue is better. The youthful mind, fascinated by the attractions that irradiate the form of Knowledge, and ambitious with a generous ardour of surmounting the difficulties which prevent access to her favours, is but too prone to look with indifference at the plainer and severer form that stands above the other. But be assured, my young friends, that as you advance in life (unless, which God forbid! your hearts should by intercourse with the world become hardened or perverted), you will set a higher and higher value on Probity and Benevolence, and you will adopt the sentiment of the poet, that

"An honest man's the noblest work of God."

The most intellectual of the Holy Apostles, declared that "Though he understood all mysteries and all knowledge," yet, "if he had not charity [which is the type of all virtue], he was nothing." "Knowledge," he adds, "may vanish away, but charity never faileth."

"Mortals that would follow me,
Love Virtue,—she alone is free;
She can teach ye how to climb
Higher than the sphery chime;
Or if Virtue feeble were,
Heaven itself would stoop to her."

COMUS.

But, after all, virtue is not easily separable from knowledge. Wisdom is knowledge applicable to practice, and knowledge is implied in the exercise of the highest virtues, and is subsidiary to them. He who has the amplest knowledge has the largest opportunities of glorifying his Maker, and doing good to his fellow-creatures. "The learned man," says Bacon, "doth ever intermix the correction and amendment of his mind with the use and employment thereof. Nay, farther, in general and in sum, certain it is that *veritas* and *bonitas* differ but as the seal and print; for truth prints goodness; and they be the clouds of error which descend in the storms of passions and perturbations."

Lastly,—reverently bear in mind what is the source of all knowledge, and what is its most exalted form. The inspired writer of the oldest and one of the grandest of poems,—the first propounding, and the fullest solution of, those world-old enigmas,—human life and human destiny,—makes one of his interlocutors exclaim, "Where shall Wisdom be found, and where is the place of Understanding?" And then he tells how the price of it is above "the gold of Ophir,

and the precious onyx, and the sapphire," and not to be exchanged "for jewels of fine gold;" and that its source "is hidden from the eyes of all living;" and then with sublime simplicity, he declares that "God understandeth the way thereof, and he knoweth the place thereof;" and that he found it in the midst of the mightiest works of creation. "For He looketh to the ends of the earth, and seeth under the whole Heavens; to make the weight for the winds; and He weigheth the waters by measure. When He made a decree for the rain, and a way for the lightning of the thunder; then did He see it and declare it; He prepared it, yea, and searched it out. And unto man He said, '*Behold, the fear of the Lord that is wisdom; and to depart from evil that is understanding.*'"

ON THE

LIFE, WRITINGS AND CHARACTER

OF THE LATE

JAMES COWLES PRICHARD,

M.D., F.R.S., Etc., Etc.

This Memoir was read in March, 1849, at the Meeting of the Bath and Bristol Branch of the Provincial Medical and Surgical Association.—[Ed.]

DR. Prichard was born at Ross, Herefordshire, in the year 1786. His education was altogether private. His father, a man of a highly cultivated and refined mind, superintended it with the help of different masters or tutors. A strong inclination to study very soon manifested itself. It was often requisite to compel him to leave his books in order that he might have needful recreation and exercise; yet when he joined his companions in the play-ground he entered into their sports with as much animation as the idlest and gayest. Some of his early friends even avow that their most vivid recollections of the young Prichard have reference to his love of fun. The studies to which he most eagerly addicted himself were History and Languages. For acquiring the latter he had a remarkable aptitude. It was a great pleasure to him when he visited Bristol to talk with foreigners, who arrived at that port, in their own tongues. On one occasion he accosted a Greek sailor in Romaic, and the man was so delighted that he caught the boy-linguist in his arms and kissed him heartily.

When the choice of a profession became necessary he selected that of Medicine, not from any bias towards it, but because it presented no difficulties to him as a member of the Society of Friends, and at the same time admitted of his pursuing his favourite studies. He was first placed with Dr. Pole, of Bristol, who had a considerable reputation for skill in anatomical preparations.

From Bristol he went to Staines, in order to learn Medical Pharmacy under Dr. Pope and Mr. Tothill.

In due time he repaired to London, and devoted himself to the study of Anatomy, in the school attached to St. Thomas's Hospital. He afterwards removed to Edinburgh, where he spent three years of hard study. Amongst his fellow-students the most distinguished were Arnould, Estlin, and Hancock, and they continued to be his intimate friends for the remainder of his life. After his graduation in Edinburgh (1809), he spent a few terms in Cambridge, having become a member of Trinity College. In the following year he joined the Communion of the Church of England, and having determined to pass some time at Oxford, he entered at St. John's College; but, not finding the society congenial, he took his name off the books and entered as a Gentleman Commoner, at Trinity. The time that he remained at Oxford must have been very short, for in 1810 he began his career in Bristol. He was appointed Physician to St. Peter's Hospital, about the year 1812, an appointment more memorable than any other that he subsequently held, because this Institution contained a class of patients whose maladies gave an impulse to his prosecution of a particular department of Pathology with which his name will ever be associated. His work on Nervous Diseases, as well as a later one on Insanity, was founded on the experience which he had gained in the wards devoted to insane patients in St. Peter's Hospital. In 1813 he published the first edition of his "Researches into the Physical History of Man." In 1816 he was elected Physician to the Bristol Infirmary. To his duties in that magnificent institution he devoted himself with a zeal worthy of the office, and reaped from its fertile field a vast amount of practical knowledge. He took an active part in the foundation of the Bristol Literary and Philosophical Institution; he frequently delivered lectures, and read papers at the meetings of the Philosophical Society, and was appointed one of its Pro-Directors.

It was wonderful how much he contrived to accomplish, even while engaged in his large private practice. This was in part owing to his

power and habit of employing small fragments of his time. His knowledge was so completely under his command, and his faculties were in such constant exercise, that he could immediately return to an argument or a train of thought, undistracted by any recent interruption. He made time also by his habit of early rising, which gave him three or four hours before the business of the day commenced. Whatever he undertook, he devoted the whole energy of his mind to its completion. He used to say that he experienced what John Wesley used to feel, when a student at Oxford, "the lust of finishing."

In 1845 he retired to Town, having been appointed Her Majesty's Commissioner in Lunacy; an honourable and comparatively lucrative appointment; at least, lucrative in comparison with most medical appointments, for no profession is so destitute as our own of offices of high emolument. No one better deserved a public reward, not only for his exertions in behalf of science in general, but also and especially for his contributions to the science and practice of that particular department of medicine.

Honours, such as belong to men of science, fell thick upon him. He became a Fellow of the Royal Society. He was elected Corresponding Member of the National Institute of France, and of the French Academy of Medicine. Besides these distinctions he received diplomas of honorary membership from all the chief learned societies on the continent and in America. His work on Egyptian Mythology, and that on Nervous Diseases, had the honour of being translated into German. The people who speak that language were, I am afraid, more early alive to the great merit of his works, and even more interested in them, than his own countrymen. In 1835 the University of Oxford determined on conferring upon Dr. Prichard the degree of Doctor of Medicine by diploma,—the very highest honour which she has the power of bestowing, and which has been given at very long intervals only, and only to pre-eminent merit. In that year the Provincial Medical and Surgical Association held its anniversary in Oxford, under the presidency of the accomplished Regius Professor of Medicine, Dr. Kidd. Dr. Prichard had been appointed to deliver the Annual Address, and the day of the meeting was happily selected for the presentation of the diploma, the University deputing the President to hand it to him whom she thus delighted to honour. Those who know, as I do, the natural eloquence and classical refinement of Dr. Kidd, will imagine how wisely the University had chosen her repre-

sentative. The scene was one that could not be easily forgotten by those who witnessed it. Under the august dome of the Library, built by the munificence of a physician of other days (Dr. Radcliffe), some of the most eminent members of the profession, from the metropolis and the provinces, were assembled. Dr. Prichard appeared rather pained than elated by all the flattering notice that fell upon him, and was obviously relieved to turn attention from topics so personal to him by reading his Retrospective Address.

In a life like Prichard's the most remarkable events are his works. These I shall presently enumerate. It only remains for me in the present department of my subject to relate that he was in full mental vigour when overtaken by his last illness. This was of comparatively short duration. It was apparently occasioned by fatigue and exposure during the performance of his public duties. He fell ill at Salisbury, but he was removed to his home, Woburn Place, Russell Square, London. The disease baffled all the efforts of his medical friends, and after great suffering, he died on the 23rd of December, 1848.

The work by which Dr. Prichard's name is best known to the world is that with which he commenced his scientific career, and which, ever improving under the continued consideration which he gave it, and ever deriving augmentations from the additions which he was perpetually making to his stores of knowledge, was the companion of the rest of his life. Works which derive their subject-matter from the world of thought only, when once completed are rarely added to. Any subsequent processes they undergo are those of finish and elaboration. But those which take their theme from the book of nature are not easily ended. Farther study of that book only brings more and more matter for extract and interpretation.

The Physical History of Mankind, when born into the world, was an Inaugural Dissertation of 150 pages, which was a very unusual length for an Edinburgh Thesis, the average of such compositions varying from 20 to 30 pages. It was entitled "De Humani Generis Varietate." In 1813 it was expanded into a goodly octavo volume, and appeared in an English garb under the title, "Researches into the Physical History of Man." A second edition in 1826 appeared in two volumes, illustrated with plates. The first volume of a third edition was published in 1836. This edition extended over eleven years, the

fifth and last volume having been published in 1847. While it is highly instructive to survey the gradual development of this production, growing with the growth of the author's mind and knowledge, it is no less interesting to trace the germinal nucleus, the generative idea in the original Thesis.

When Dr. Prichard entered upon the study of the Natural History of Man, it was an almost uncultivated field. Camper had made an attempt at classifying the human races according to the facial angle, having found that in the European it averaged 80°, in the Kalmuck 75°, and in the Negro 70° only. But his views were founded on a very narrow induction, for his collection of skulls was very small. Their inaccuracy in other respects, and especially the disregard of the difference between the infantine and adult skull, has been particularly pointed out by Professor Owen.

That Blumenbach was the real founder of Ethnology Dr. Prichard repeatedly announced; although his own researches had commenced before the work of the illustrious German had come into his hands. Blumenbach, having examined a very large number of skulls, divided the prevalent forms of the human head into five departments, which he designated, not according to the form, but by the names of the races to which they belonged, or of the regions of the world whence these races were supposed to have originated. They were the Caucasian, Mongolian, American, Ethiopian, and Malayan; a distribution pronounced by Doctor Prichard to have been complete at that period of Ethnographical knowledge. This principle of classification, if now adopted, would require us to enumerate many additional varieties in the shape of the cranium, and to constitute correspondingly additional human races.

If we except, then, what had been done so slightly by Camper, and more elaborately and scientifically by Blumenbach; and if we also pass over, as we may very easily do, the vague *a priori* speculations of Sir W. Jones and Lord Kaimes (the former arguing for one species because one pair could by calculation be proved more than sufficient for peopling the earth, the latter presuming that Providence would not allow so many fair and fertile regions to wait for inhabitants by the slow process of dispersion, but that autochthones must have been *ab origine* assigned to them); if we except these, the ground which under Dr. Prichard's labours became so fruitful of interesting observation and inference, was when he entered upon it, unknown and sterile.

Dr. Prichard first set himself to inquire whether the *genus Man* contains more than one species. He carefully examined the characteristics of different tribes as to colour—the albino, the yellow, the tawney, the red, and the black: as to diversity of form, whether as to physiognomy, cranial configuration, or peculiarities in other parts of the skeleton; diversities of stature, as in Patagonians and Greenlanders; and having compared their diversities with known tendencies to variation in the inferior species of animals, he arrived at the conclusion that they are strictly analogous phenomena, "depending on a principle of natural deviation, and, as such, furnishing no specific distinction." The diversities of figure, considered by some to be an insuperable argument in favour of distinctness of specific origin, were found to be rather less permanent in mankind than those of colour, "and none of them so general in any race of men that it is not in many examples wanting." (1st Edition, page 85.) But though this conclusion was arrived at, it might still be argued that original stocks of the same species might have arisen in different parts of the world. To meet this view he inquired into the laws which govern the distribution of some of the inferior species (Mammalia), and found that every existing species may be traced with probability to a certain point originally its own abode, and that few or no species have been found in countries separated from their primary seats by barriers which their locomotive powers and peculiar structure do not enable them to surmount.

"On the whole, it appears that it has not been the scheme of nature to cover distant parts of the earth with many animals of every kind at once; but that a single stock of each species was first produced, which was left to extend itself according as facilities of migration lay open to it, or to find a passage by various accidents into countries removed at greater or less distances from the original point of propagation." (1st Edition, page 145.)

He then proceeds to consider the migrations of man, and whether the facts prevent our applying the general inference drawn above to the particular instance of our own species, and he finds in them nothing irreconcilable with such a view.

The next inquiry he made was into the causes of the diversities in the human race. Climate has some influence, but civilization more. Varieties spring up more readily in temperate climates. One conclusion at which Dr. Prichard arrived in connection with this subject, and which has been the subject of more discussion among the

uninformed than any other, is the transmutation from the Negro to the European ; together with the announcement of his opinion that the original human stock probably belonged to the former race. The arguments adduced in support of this idea were as follows :—(1.) The analogy of lower species in which changes of colour are from dark to lighter hues. The lighter colours of domestic animals are the effects of cultivation. (2.) We have examples of light varieties appearing among the negro races, but not of the reverse. (3.) The dark races appear by their organization better adapted to the wild or natural state of life. Witness the easy parturition in the female, and the high development of the senses of smell, taste and hearing. (4.) All nations that have never emerged from the savage state are negroes, or very similar to negroes.

The next department of the inquiry carries him deeply into the physical history of the most remarkable races, which I cannot, of course, follow ; but I may notice that with wonderful extent and minuteness of erudition he endeavours to prove a common origin of the ancient Indians and Egyptians from their mythologies, theogonies, and the physical character of the people respectively, and thus to support the previous inference that the most ancient nations of which any record exists were negroes. An investigation of the origin of the European races, conducted with no less learning and sagacity, led him to the recognition of an eastern origin, or connection by affiliation with the Asiatics.

Such is a faint outline of the original form of the great work by which Dr. Prichard's name will go down to posterity. Many were the modifications which it underwent, not only by expansion and addition, but also by withdrawal and absolute mutation. Topics which formed rather prominent members of the original organism were in the process of development dwarfed down to a proportion which anatomists call rudimentary. Such is the opinion once so strongly and broadly stated as to the derivation of races from an original negro stock.

The second edition appeared in 1826, that is, after the lapse of thirteen years. It was enlarged to fully double the limits of the first, and entirely re-written. A more ample space was given at the beginning to the preliminary inquiry, as to the laws which govern the distribution of organized beings in general. This investigation, in the first edition, had been limited to the Mammalia. It now included the whole range of organic nature, beginning with the species of plants

and extending to the whole of zoology. The conclusion arrived at in his previous more limited investigations were abundantly strengthened, and thus expressed :—

"The inference to be collected from the facts at present known seems to be as follows :—The various tribes of organized beings were originally placed by the Creator in certain regions for which they are by their nature peculiarly adapted. Each species had only one beginning in a single stock : probably a single pair, as Linnæus supposed, was first called into being in some particular spot, and their progeny left to disperse themselves to as great a distance from the original centre of their existence, as the locomotive powers bestowed on each species, or its capability of bearing changes of climate and other physical circumstances, may have enabled it to wander."

A new element in this edition was a discussion of the criteria of identity or diversity of species, by reference to the principal laws of the animal economy; *e.g.*, (1.) As to duration of life, times and frequency of breeding, periods of utero-gestation, and number of progeny; liability to the same diseases; and possession of like faculties, instincts, and habits. (2.) To the laws of propagation of mixed breeds. (3.) To analogy to known variations.

The application of these tests to the human races was attended with the same results as before. In the course of the inquiry into analogous variations we meet with some new terminology, which was an unquestionable improvement. (Indeed, I may remark, in passing, that Dr. Prichard was particularly happy in his coinage of new names). Thus the various black-haired races of man constitute the Melanic variety. The Xanthous comprises brown, auburn, yellow, flaxen, or red. The Albino is distinguished by white hair and red eyes. Again, in considering the varieties in the form of skulls, he classifies them according to the form of the vertex, as Meso-bregmate, Steno-bregmate, and Platy-bregmate; the type of the first being the Caucasian, of the second the Negro, of the third the Mongole.

The bulk of the work consists of the Physical History of particular races, evidencing most remarkably the continued labour that had been spent on the investigation since the first edition. The Races are considered under six divisions,—1st. The African Races. 2nd. Those of the Great Southern Ocean. 3rd. The Indo-European Nations. 4th. The Western Asiatics, including the Syrian or Semitic nations, Georgians, and Caucasians. 5th. The North and Eastern Asiatics,

including the Finnish or Tschudish Nations, the Samoiedes, the Mongoles, the Tartar or Turkish Races, the Tungusians, and the Chinese. 6th. The Native Races of America.

The last book is devoted to a survey of the Causes which have produced Varieties in the Human Species. In the course of it appears an interesting discussion of facts relating to Hereditary Transmission of peculiarities of structure, the bearings of which on the chief question are obvious; and he shows as a general law how none but connate peculiarities descend to the offspring. "Whatever varieties are produced in the race have their beginning in the original structure of some particular ovum or germ, and not in any qualities super-induced by external causes in the progress of its development. Yet the influence of climate and modes of life, domestication, &c., is unquestionable, and therefore, according to this view, it must be on the ovum that this influence is exerted."

The argument in this part of the work appears to me less satisfactory than in the other parts. For while it is strongly insisted on, that acquired peculiarities are never transmitted to the offspring, yet abundant proofs are given that great variations arise in races under the influence of external circumstances of climate, and in adaptation to them. No more striking instances can be adduced than those which belong to the Indo-European family, which were originally of one stock, yet which now present the black Hindoos of the Deccan and the tribes of the Northmen of Europe. Dr. Prichard does not profess to explain how it is that the children of parents who have been exposed to changes of climate display peculiarities of structure corresponding with the climate, but he is satisfied that it is not by any change produced in the parents but by some qualities which they impress on the progeny. When a peculiarity has once been generated, that is, when it shows itself in an individual from birth, there is no difficulty in understanding its propagation. Thus many varieties may occur casually, as in the six-fingered family, the porcupine family, and the like. But the origination of varieties after transplantation to new localities is too extensive and uniform, both in the human and in the inferior species, to be explained in this manner. In the third edition the same line of reasoning is not pursued: but both in that edition and in the volume on the Natural History of Man, facts are adduced proving the transmission of acquired properties from parents to offspring, more especially those of a psychical nature, as in the acquired

instincts of dogs. After some consideration of the whole subject, the following appear to me to be the most probable conclusions. In all healthy individuals of a species the elements of the varieties of that species exist; some actually developed, others only potentially present. External circumstances are adequate or even necessary to their development, but they can operate only through successive generations. The principal facts adduced against the hereditary transmission of acquired peculiarities are those having reference to mutilations, losses of members, &c. These cases are altogether different from those in which a change has taken place in the colour of the skin under the influence of climate; for this change is not effected by subtraction of parts, but by increased action in a particular portion of the cutaneous organism. Now the offspring represents the properties and tendencies in the organization of the parents at the time of conception. Abundant instances in proof of this remark might be derived from pathology. The progeny of parents embrowned during a tropical residence, it is true, may be born quite fair, and yet with a liability in the skin to be influenced by climate in like manner with the parents, and to a greater degree. The next generation will inherit a yet stronger liability; but many centuries may need to pass before the structural change becomes so great as to be obvious at the time of birth. When the structural variety has been produced, it may require at least an equal length of time for external alterations to produce a return to the original type.

The work concludes with the consideration of the diversity and origin of Languages, an investigation which proves highly favourable to the inference drawn from other lines of argument, that the races of men have descended from a single pair.

The scientific reputation of Dr. Prichard, which had been gradually increasing from the time of the first edition of this work, as well as from his book on the Egyptian Mythology, may be said to have now become universal. Among the learned of France and Germany he took the highest rank.

The last edition, as I have said, commenced in 1836, and was issued in single volumes, which appeared at intervals during eleven years. The actual amount of matter was treble what had constituted the second edition, and the whole was again re-cast and re-written.

The first volume is entirely devoted to the consideration of the two questions;—1st, Whether each species in the animal and vegetable

world exists only as the progeny of one race, or has sprung originally from several different sources. 2nd, Whether the various races of men are of one or several species. In pursuance of this inquiry, analogically conducted, that is, by comparing different tribes as to their anatomical and physical characters, the author introduced matter of a highly interesting nature under the head of Psychological Characters.

He showed that no characters are more primordial and none more permanently transmitted than instincts, feelings, propensities, and habitudes of action. In trying the different races of man by this criterion, he found that there were none in which the characters belonging to the species are wanting. However degraded the castes, whether Bushmen of Africa, Australian savages, or Lappes of northern Europe, still we find in them the moral and social attributes which distinguish humanity. Not only is there no tribe wanting in the use of speech, and none in which we do not find traces of those necessary arts of life which consist in the use of fire, of artificial clothing, of arms, and the art of domesticating animals; but also it has been ascertained that all tribes give evidence of the possession of sentiments, feelings, sympathies, and internal consciousness, with resulting habitudes of life and actions, which, more than any outward or physical character, whether of skull or of skeleton, of complexion or of hair, give the stamp of human likeness.

The following passage affords a striking view of the community of character in different races as to one most important law of thought and feeling, and is at the same time a specimen of the author's masterly style of writing.

"If we could divest ourselves of all previous impressions respecting our nature and social state, and look at mankind and human actions with the eyes of a natural historian, or as a zoologist observes the life and manners of beavers or of termites, we should remark nothing more striking in the habitudes of mankind, and in their manner of existence in various parts of the world, than a reference which is everywhere more or less distinctly perceptible to a state of existence after death, and to the influence believed both by barbarous and civilized nations to be exercised over their present condition and future destiny by invisible agents, differing in attributes according to the sentiments of different nations, but universally believed to exist. The rites everywhere perfomed for the dead, the various ceremonies of cremation, sepulture, embalming, mummifying, funereal processions,

and pomps following the deceased, during thousands of successive years in every part of the earth,—innumerable tumuli scattered over all the northern regions of the world, which are perhaps the only memorials of races long extinct—the morais, pyramids, and houses of the dead, and the gigantic monuments of the Polynesians,—the magnificent pyramids of Egypt, and of Anahuac,—the prayers and litanies set up in behalf of the dead as well as of the living in the churches of Christendom, in the mosques and pagodas of the East, as heretofore in pagan temples,—the power of sacerdotal or consecrated orders, who have caused themselves to be looked upon as the interpreters of destiny, and as mediators between the gods and men,—sacred wars desolating empires through zeal for some metaphysical dogma,—toilsome pilgrimages performed every year by thousands of white and black men, through various regions of the earth, seeking atonement for guilt at the tombs of prophets and holy persons,—all these, and a number of similar phenomena in the history of all nations, barbarous and civilized, would lead us to suppose that all mankind sympathize in deeply impressed feelings and sentiments, which are as mysterious in their nature as in their origin. These are among the most striking and remarkable of the psychical phenomena, if we may so apply the expression, which are pecular to man; and if they are to be traced among races of men which differ physically from each other, it will follow that all mankind partake of a common moral nature, and are, therefore, if we take into account the law of diversity in psychical properties allotted to particular species, proved, by an extensive observation of analogies in nature, constitute a single tribe."—(Vol. 1, p. 175-6.)

The Ethnography or Physical History of each of the different races is prosecuted in the four succeeding volumes. The prodigious amount of information is not more surprising than the skill with which the vast mass of facts is made to bear on the solution of the great question. In this department one is struck by the great accession of strength derived from the comparison of languages.*

But while the "Researches" were undergoing their fullest and, alas! their final development, Dr. Prichard found time to produce a

* As I have noticed the change of terminology, as to the forms of the cranium, in the 2nd edition, I ought to have stated that in the 3rd edition the names were again changed to,—1. The Oval or Ooida., which is the skull of the European and western Asiatic nations. 2. The Prognathous, so called from the prominence of the upper jaw, as in the negro of the Gold Coast. 3. The Pyramidal, or broad-faced skull, of which form the Mongoles present a good specimen, and the Esquimaux an exaggerated one.

volume on the Natural History of Man, containing an account of the different tribes, their peculiarities, and the causes of those peculiarities, but in a more summary way than in the large work, to which he refers for evidence of the positions which he lays down. In the preface he adverts to two opposite classes of critics,—those who accuse him of hesitation and reserve, or over caution, in his assertion of the great principle of the unity of the human species, and those who, on the other hand, allege against him an obstinate and intolerant adherence to this view: and he was justified in laying claim to the probability that he had pursued a just, middle, and philosophical course, from the very opposite nature of those charges.

After surveying this work, one might say that it would have been no mean result, had it been the single product of Dr. Prichard's life and labours. But we shall see that he found time for many others, some more or less cognate to it, others of a remote nature.

In 1819 he published his treatise on Egyptian Mythology, the main object of which, in a historical point of view, was to disprove the opinion entertained by Professor Murray, "that the religion and philosophy, as well as the language and all the other possessions of the Egyptian people, were peculiar to themselves, and entirely unconnected with those which belong to other nations of antiquity;" and consequently, that the Egyptians were a race peculiar to Africa. He endeavoured to prove the early connection between the Hindoos and Egyptians, by their similarity of religious institutions, social castes, &c. Whether this connection was by colonization or by origin from the same stock he has discussed in the "Researches."

Against the former supposition the historical and other difficulties appear insuperable. And the latter conclusion, at first sight, seemed almost impossible to be maintained, from the extreme diversity of the Indian and Egyptian languages. Yet, on reading the discussion of this subject, in the second volume of the "Researches," we find the force of the difficulty breaking down under the powerful reasoning brought to bear upon it from the profound philological resources of the author's learning. He shows how much greater was the tendency to diversification in the structure of languages in the earlier ages of the world. He instances the diversity which had taken place in those sister-langnages,—the Sanskrit, Greek, Latin, and Mæso-gothic, though sprung from a common stock, and which diversity had taken place as far back as fifteen centuries before the Christian era,—and he

argues that "the diversifying process, within nearly an equal period of time, may have given rise to differences even so great as those which exist between the Semitic and Indian languages. That such was the fact we have the historical proof above cited. But if so great a diversity in language as this was really brought about, no difference of human idioms will afford proof of original diversity of race, and the Egyptians and Hindoos may have had common ancestors, from whom they derived their characteristic traits of resemblance." After this statement, it is very interesting to find that Dr. Prichard's sagacious reasonings have been confirmed by the latest researches; and, as Dr. Hodgkin has remarked, "from a quarter the least expected. Recent investigations into the structure of the old Egyptian language, revealed to us by the successful interpretation of the hiero-grammatic writing, have demonstrated an early original connection between the language of Egypt and the old Asiatic tongues. By this discovery the Semitic barrier interposed between the Egyptian and the Asiatic races is broken down, and a community of origin established which requires the hypothesis neither of the immigration of sacerdotal colonies nor of the doubtful navigation of the Erythræan Sea."*

A remarkable part of the work was the the analysis of the remains of Egyptian Chronology. He showed that Manetho's Chronicle was constructed, perhaps by mistake, from the combination into one whole of many different records or tables of kings, which, though apparently successive, can be shewn by internal evidence to contain repetitions of the same series.

The Chevalier Bunsen, in his great work on Egypt, has done justice to the value of Dr. Prichard's labours in this field of inquiry, when he says that "simultaneously with the first steps in the progress of modern hieroglyphical discovery (in 1823), Dr. Prichard, one of the most acute and learned investigators of his time, had once more vindicated the claims of Egypt to a primeval chronology, and suggested a collation of the lists of Eratosthenes and Manetho, as the true method of elucidating the earliest period. In the work on Egyptian Chronology and Mythology he shows that the continually recurring coincidences which they offer must represent a chronological canon."†

* Abstract of a Memoir of Dr. Prichard, by Dr. Hodgkin, in the British and Foreign Medico-Chirurgical Review, April, 1849.

† Egypt's Place in Universal History.—(Vol. 1, p. 242.)

Another work, bearing on the great question, was entitled "The Eastern Origin of the Celtic Nations, proved by a comparison of their dialects with the Sanskrit, Greek, Latin, and Teutonic Languages, forming a supplement to Researches into the Physical History of Mankind." Languages display four kinds of relations:—1. As to vocabularies. If the communication between the nations was one of close commercial intercourse or of conquest, the words in common will be found to have reference to the new stock of ideas thus introduced. Such is the influence of the Arabic on the idioms of the Persians and Turks, and of the Latin upon some of the dialects of Europe. But if the connection was of a more ancient and intimate nature, the correspondence in the vocabularies will be found to involve words of the most simple and apparently primitive class, expressive of simple ideas, and universal objects. 2. There are languages with few words in common, but having a remarkable analogy in grammatical construction. Such are the polysynthetic idioms of the American tribes, and the monosyllabic languages of the Chinese and Indo-Chinese. 3. Some languages present both these characters of affinity, and are denominated by Dr. Prichard, *cognate*. 4. There are languages in which neither of these connections can be found. Such languages are not of the same family, and generally belong to nations remote from each other in descent, and often in physical character. Dr. Prichard proved that the Celtic nations spring from a common stock with the Indo-European group from an elaborate comparison both of primitive words and of grammatical structure.

The last work that I have to notice, of a purely scientific character, is the "Review of the Doctrince of a Vital Principle." It is an admirable specimen of physiological reasoning, and had it been duly studied by many writers who have since treated of the subject-matter of it, much needless writing, both in support and in refutation of a hypothesis that had been already demolished, might have been saved.

The object of the work was to review the Hunterian doctrine of a vital principle; that is, of a subtile agent, somewhat analogous in its nature to electricity, invisible, impalpable, and imponderable, manifesting itself only by its effects, controling and modifying mechanical and chemical properties in a manner peculiar to itself, altering affinities, disposing to new combinations, so as to effect the separation of a variety of substances from the blood, evolving animal heat, presiding over chymifaction, exciting processes of development, nutrition, and

reparation, and preserving the fluidity of the blood. He first points out that this doctrine is not a theory, because the actual existence of the principle in question has never been proved; for a theory requires the alleged cause to be proved to be a fact in itself, before it is shewn to stand in that relation to the phenomena assigned to it as effects. The doctrine in question is only a hypothesis, inventing the principle as a complete and the only means of interpreting certain phenomena. In the examination to which Dr. Prichard subjects it, he considers first the analogical arguments in its favour. (In this place I shall take the liberty of making use of a review which I wrote many years ago.) The hypothesis of a vital principle is allowed by its advocates not to admit of direct evidence; but they consider that collateral probabilities are in its favour, and that it is adequate to all the explanation required of it. An examination of the evidence put forth in support of these positions occupies the principal portion of the author's dissertation.

"Among the analogies," says Dr. Prichard, "adduced in favour of this doctrine, one has been already adverted to; I mean, that of electricity, or the operation of the electric or galvanic influence. It must be confessed that this analogy is so vague and indefinite as to afford scarcely a shadow of probable evidence. There is nothing in it on which the mind can lay hold with a clear and distinct apprehension."

Another analogy, and even more remote than the former, has been derived from the immaterial soul. The existence of this principle has been conceded on inferential grounds only, and the believers in a vital principle claim a similar allowance for their doctrine. They urge that if a soul or immaterial entity is allowed, because it is necessary to explain mental phenomena, the existence of a vital principle ought to be conceded, because it is no less essential to the production of organic phenomena. Dr. Prichard, however, shews that the two doctrines are founded on premises that have no analogy whatever. Thus the immateriality of the soul is argued from the utter diversity of mental from material phenomena, from their being contemplated by internal consciousness instead of external sensation, from their indivisibility as contrasted with the infinite divisibility of matter, and from the impossibility of resolving them into the component qualities of matter, a process which may be executed on very physical substance. But this kind of reasoning is perfectly inapplicable to the functions of an organized body. We are never made acquainted with these phenomena

as with those of mind, by consciousness, but by the same means as reveal to us other physical objects.

"The whole sphere of agency ascribed to the vital principle is, therefore, within the region of matter and its attributes; and if its existence is capable of proof, it must be on grounds totally different from those on which we have proceeded with respect to the existence and properties of a soul or immaterial being."

In the above very brief abstract of this part of the author's argument, we have passed over a very masterly discussion of the question of materialism, in the fifth section. We beg particularly to direct attention to his disposal of Dr. Priestley's well-known argument; viz., that the phenomena of mind, and those of matter, belong to the same substance, because the former are never seen but in conjunction with the latter. Dr. Prichard's reply is as follows:—

"The whole universe displays the most striking marks of the existence and operation of mind or intellect, in a state separate from organization, and under conditions which preclude all reference to organization. 'The universal mind,' says a distinguished philosopher (Dugald Stewart), 'though everywhere present, where matter exists, though everywhere moving and arranging the parts of matter, appears to do so without being united with matter as is the case with visible created beings. There is, therefore, at least one being or substance of that nature which we call mind, separate from organized body.'"

The answer is very ingenious, but does not appear to us to be completely conclusive. The manifestations of intelligence in the two instances are of different kinds. Dr. Priestley seems to refer to the actual manifestation of thinking and feeling properties, not of their effects merely; and to the non-appearance of such properties in action, excepting when they are connected with organized matter. But the manifestations of mind and intelligence in the works of creation are such as are afforded by the *results* of the operation of mind on matter; and although it is highly improbable that the mind which acted upon it was connected with organization, yet there is no evidence to the contrary derivable from these signs; indeed they do not seem to us to indicate either the one view or the other. By the same reasoning, if, on a desert island, a tool or a piece of machinery were discovered, which furnished evident marks of the operation of human contrivance, there would be no intimation from this source alone, that the designing mind was, or was not, connected with a brain and nerves; the

knowledge that the human mind acts in concert with an appropriate organization, would be the result of other kinds of experience. The evidence, then, of the Divine mind, is contained in the effects of its operations; and we are ignorant whether any organization is, or has been, made use of by this exalted principle. The evidence of human or animal mind is also contained in its effects; but we likewise know that it never produces these results, except in co-operation with the nervous system.

We may be wrong in this view, and it is suggested with diffidence; but even if it be correct, and the objection founded on a different view of it, to Dr. Priestley's argument, be consequently weakened, there still appear to us to be sufficient reasons for rejecting the conclusion of the materialist. A certain collection of properties which we call mind, is never presented to our observation, except in connection with a collection of properties utterly dissimilar, which we designate organic matter; but it is not a legitimate inference from these premises, that the connection is one of *dependence*, not of *alliance* only. It is true, that when the organic phenomena are dissipated the others also disappear; but if the existence of the latter in other beings than ourselves can only be made known to us through the medium of the former, as by motion, speech, action, &c., how can we presume to say that the thinking principle was dependent upon that medium, merely because the latter was destroyed? A man suddenly struck blind might, with equally good logic, argue that, because he had always recognized the existence of the sun in connection with his eyes, and because an impairment of his visual organs had destroyed the perception of that luminary, the existence of the latter was, therefore, dependent on the former. This is not precisely Dr. Priestley's position; but supposing that we allow, that in consequence of mental properties being never manifested, except in connection with those of organization, they must, therefore, belong to the same entity or substance, what possible use can be made of such a conclusion? For what is an entity abstracted from its properties? Nothing: for nothing is the absence of properties. If materialists are satisfied with the possession of this conclusion, we are well satisfied, for our own parts, to concede it to them; and do not care to prove that the two classes of properties belong to separate entities, or nothings. This view will appear satisfactory only to those who can discard from their minds the notion of there being necessarily a substratum of properties. We consider this substratum only as a

term expressing the *collection* of certain properties, and have elsewhere endeavoured to illustrate the subject by saying that "the prismatic rays, incapable of independent existence, belong to the substance light, which, in its turn, cannot exist without them; and thus properties are attached to substance, which is itself made up of those properties." The difficulty in receiving this opinion is produced, in a great measure, by the term *property*, which expresses relation to something else. But the anaylsis of properties shews them to be only expressions of various kinds of experience, which are grouped in various relations, and divided into two great classes, the former of which, we are told by instinctive belief, are the result of a causation external to our own identity, while the latter have their origin within ourselves; the one constituting what is called matter, the other what is called mind. The two are thus felt or experienced to be independent of each other, and no evidence can go higher.

After disputing the analogical evidence set up by the advocates of a vital principle, the author proceeds to examine the other argument adduced in its favour, to wit, that the functions of living beings can be explained only by the hypothesis in question. We cannot follow the refutation, as it would lead us into too many details. The result is, that the doctrine is not only inadequate to the interpretation of the facts, but also injurious to a philosophical inquiry into them, by allowing us to stop short of an ultimate analysis of complex phenomena, in the same manner as the old physiologists ceased to inquire further into the process of digestion when they had stumbled upon a *vis concoctrix*.

The work concludes with an interesting dissertation on the mental faculties. An attempt is made to distinguish those which require the instrumentality of nervous structure for their operation from those which are independent of it. But we do not think the attempt at this distinction a successful one.

I now proceed to notice the more strictly professional writings of Dr. Prichard. Of this class the earliest was (1822) "A Treatise on Diseases of the Nervous System," founded on cases observed in his practice at Saint Peter's Hospital. The main object of this work was to assist the discrimination and classification of those secondary forms of nervous disorder which spring from remote organs, and which, in the language of Dr. Marshall Hall, comprise the nervous diseases produced by eccentric irritation. The diseases particularly described were

Epilepsy and Mania. And he distinguished their forms, as arising,—(1.) From irregularity of the functions of the uterine system. (2.) From disorder of the alimentary canal. (3.) From hepatic disorders. (4.) The idiopathic or cerebral form. These forms were happily described and were illustrated by a large number of instructive cases. Although the author took no credit to himself for originality in ascribing many cases of nervous disorder to faults in the organic functions, yet it was plain that no one before him had so well discriminated the different kinds, and referred them to their appropriate causes. The work added greatly to Prichard's reputation, and it had the honour of being translated into German.

The next professional writings were the articles in the "Cyclopedia of Practical Medicine," comprising, Delirium, Hypochondriasis, Insanity, Somnambulism and Animal Magnetism, Soundness and Unsoundness of Mind, and Temperament. Of these the largest and most important was the article Insanity. It was afterwards expanded into a separate treatise, which will always be a classic in this department of medical literature. Its most striking feature was the discrimination of that form of mental derangement which is now known as Moral Insanity. M. Pinel had described mania without delirium, consisting of ungovernable fury without any delusion;* but he had not pursued the subject farther. Dr. Prichard had the great merit of proving the existence of insanity without marked intellectual aberration.

I shall never forget the satisfaction I derived from the study of the article Insanity, in the Cyclopedia; and the light which I then derived from it has repeatedly been a help and a guide to me in the investigation of cases of derangement in which no lesion of judgment was discoverable. On looking over the work on Nervous Diseases lately, I was surprised to find that on this subject Dr. Prichard had quite changed his views; for in this treatise, when noticing Pinel's "Mania sine delirio," he threw doubts on the existence of such a morbid condition of mind, and intimated the probability that there might be latent delusion giving origin to the disordered feelings. Subsequent inquiry and observation led him to alter his views, and, as I have said, to extend the morbid condition far beyond the limits sketched by Pinel. I shall beg permission of the Society to dwell somewhat on this point, as it is one of high importance to us as medical practitioners, as well

* He termed it "Emportement Maniaque sans délire."

as being connected more than any other practical subject with the name of Dr. Prichard. It seems to me strange that when we reflect on the large share which the emotions and sentiments and passions bear in the mental constitution of man (a fact conceded by all who have speculated upon this branch of philosophy), and when we consider that there has been no disinclination to attribute susceptibility of separate and independent derangement to another part of our constitution, I mean the purely intellectual; and moreover that the most strenuous asserters of the doctrine, that insanity, in all cases, involves a perversion of judgment, do not attempt to conceal that the propensities, tastes, and emotions, are often, or indeed in most cases, morbidly affected; I say it seems strange that the question should not have presented itself before, as to whether there are not actual cases in which mental derangement is confined to the moral feelings and the emotions, just as in other cases the perceptive and reasoning powers are the sole subjects of disorder; and stranger still, that, whether such *a priori* suspicions ever arose or not, the real existence of such cases should not have attracted observation. That they have been so entirely overlooked can only be explained on the ground that the sentiments and passions of man have been generally considered subservient to the will and reason, and that any undue excitement of the former (the passions) has been consequently supposed to arise either from a criminal want of controul on the part of the will, or from a deficiency of rational power; so that, according to this view, a man of violent passions or eccentric conduct, unless proved to entertain some delusion or hallucination, must be either wilfully perverse, or chargeable with moral delinquency.

Now, as to the slighter forms of moral insanity, as distinguished from intellectual, the subjects of them may perhaps have passed through life without producing a conviction that they were actually mad, and yet they have exhibited such eccentricities of demeanour, such waywardness of conduct, and peculiarity of temper, as to have occasioned no little concern on the part of their friends. Such persons have often inherited a tendency to insanity, have at former periods of their lives been unquestionably insane, or have suffered inflammatory affections of the brain. The characteristic distinction of such cases is that, notwithstanding the strangeness of their habits and conduct, they never betray any delusion; any belief, for instance, in things morally or physically impossible, or at variance with the general

opinion and common sense of mankind; nor do they manifest any deficiency of reasoning power; they will even display great ingenuity in accounting for the eccentricities of their conduct, and in explaining and justifying the state of moral feeling under which they appear to exist. Sometimes the derangement is manifested not so much in peculiarity of conduct as in a preternatural excitement or depression of the spirits. The latter is one of the most frequent forms of the complaint. A person is overwhelmed with despondency, and though possessed of every requisite for happiness, can take no pleasure in anything under the sun. In other cases there is a preternatural elevation of the spirits, an uncontrolable vivacity, an incessant restlessness, a desire to undertake great enterprises, and an everlasting disposition to talk loudly and boisterously, without proper regard to place or time or person. Upon the tendency which the morbid dejection manifests to become involved in religious subjects, Dr. Prichard makes the following observations:—"In examples of a different description, the mental excitement which constitutes this disease is connected with religious feelings, and this is often the case when the period of excitement has been preceded by one of melancholy, during which the individual affected has laboured under depression and gloom, mixed with apprehensions as to his religious state. A person, who has long suffered under a sense of condemnation and abandonment, when all the springs of hope and comfort have appeared to be dried up, and nothing has been for a long time felt to mitigate the gloom and sorrow of the present time, and the dark and fearful anticipations of futurity, has passed all at once from one extreme to another; his feelings have become of a sudden entirely changed; he has a sense of lively joy in contemplating the designs of Providence towards him, amounting sometimes to rapture and extacy. Such a change has been hailed by the relatives of the individual thus affected, when they have happened to be pious and devout persons, as a happy transition from a state of religious destitution to one of acceptance and mental peace; but the strain of excitement is too high, the expressions of happiness too extatic to be long mistaken; signs of pride and haughtiness are betrayed, and of a violent and boisterous deportment, which are quite unlike the effects of religious influence, and soon unfold the real nature of the case; or it is clearly displayed by the selfishness, the want of natural affection, the variableness of spirits, the irregular mental habits of the individual.

In the cases to which I have now referred there has been no erroneous fact impressed upon the understanding; no illusion or belief of a particular message or sentence of condemnation or acceptance specifically revealed; a disorder so characterised would not fall under the head *moral insanity*. The morbid phenomena in the cases of disease which I am now attempting to describe extend only to the state of the feelings and spirits, the temper, the preternaturally excited sentiments of hope, and fear, and the results which these influences are calculated to produce in the mental constitution."

Moral Insanity often presents violent anger as its most prominent phenomenon, at other times an inclination to theft, arson, or even homicide. Sometimes the most striking characteristic is a sudden change of disposition. There are many instances which show a transition from moral insanity to monomania.

On the whole, I cannot help viewing the subject as one of the most interesting in the whole range of morbid psychology. And it is impossible to think of it without having the mind filled with very melancholy reflections. The deprivation of reason, in the ordinary and most acknowledged forms of moody melancholy or of raving mania, has abundantly served the purposes of moralizers on the imperfection of human nature, or of such as have wished to exhibit the most startling pictures of human misery; and, in truth, no subject is more productive of horror, or more humiliating to pride. Yet the consideration of that perversion of the natural feelings, tastes, and habits, which constitutes moral insanity, introduces us to a wide world of human suffering, which, though it may not be peopled with such appalling apparitions as have risen before the imagination of poets, and been embodied into the undying forms of Orestes, Ajax, and Lear, yet swarms with unhappy beings; sufferers whom we view not in those throes of anguish which by their novelty throw an air of elevation or sublime indistinctness over their subjects, but in the ordinary habit of the mind, in the quiet paths of life, in the domestic chamber, and by the friendly hearth. The maniac, and the melancholic, before their maladies have been recognised, may have inflicted severe pangs on the minds of affectionate friends and relatives—for few ears are impassive to the mournful discord of "sweet bells jangled out of tune"—and their removal from society may have left blanks which can never be so well filled; but in their retirement they are followed by feelings of tenderest compassion and regret, as those who have been visited with the sorest chastisement

of heaven. Alas! how different the fate of those whom it has pleased Providence to afflict, not with aberrations of judgment, which are detected by even the simplest of sound-headed observers, but with marked obliquities of feeling, which are so easily confounded with bad passions wilfully indulged, and with evil habits wilfully pursued. In childhood, to suffer a constraining, torturing discipline, intended to controul a waywardness, the root of which is beyond the reach of the most anxious parent, or the most persevering educationist; in youth, to be marked for incorrigible vice, or for a perverseness which incapacitates for any important occupation:—in manhood, to be despised and hated for singularities of manner and conduct; to scatter confusion and dismay over a once happy household by the development of unworthy passions, and intolerable irregularities of temper; to distract an affectionate and honourable wife by strange suspicions, and unfounded jealousies; to harass the timid child by irritability, violence, and tyranny, which no tender submission can appease, no fond attentions can mitigate; to plunge helpless dependents into ruin and beggary; and in all these several conditions to be considered a person fully responsible for his actions, and as capable of subduing evil tendencies as are other people:—these are but a few of the miseries incident to the victims of the malady in question, and however inferior they may appear in the picturesque to maniacal and melancholic visitations, they are productive of far more sorrow to the individual, and of far more lasting and wide-spread distress to those around him.

Dr. Prichard published, in 1842, a small volume, "On the Different Forms of Insanity in relation to Jurisprudence, designed for the use of persons concerned in legal questions regarding unsoundness of mind." It is an extremely useful manual for the purpose, conveying the distinctions laid down in the larger work in a more popular form, mixed with rules for the guidance of the medico-legal practitioner.

In 1831 a very interesting practical paper, from his pen, appeared in the *Medical Gazette*, giving an account of a new mode of applying counter-irritation in diseases of the brain. It consisted in making an incision of the scalp along the sagittal suture, and keeping the wound open by means of peas, as in an ordinary issue. It was entitled, "On the Treatment of Hemiplegia, and particularly on an important remedy in some diseases of the Brain." The subject was renewed in a paper read before the British Association of Science at the meeting held in Bristol, in 1836. I had the honour of reading it for the author, and

I well remember the very great interest it excited among the members of the medical section, among whom were some of the most distinguished physicians and surgeons of the United Kingdom.

Were I to enumerate all his smaller compositions, both on professional and general topics, the list would be a very long one, for he contributed largely to many periodical journals and reviews. Enough has been said to shew the extent and variety of his learning; yet I cannot refrain from recording that, in 1815, he translated, jointly with Mr. Tothill, Muller's Universal History; that he rendered the Birds of Aristophanes into English verse; that he studied Biblical criticism profoundly, and made many translations from the Hebrew Scriptures.

Perhaps it would be more prudent were I now to content myself with having related the principal events and achievements of Dr. Prichard's life. The hand of a more experienced artist would be requisite to sketch such a mind and character; much more to attempt, by a skilful adjustment of light and shade and gradation of colour, to give a faithful portrait of the eminent subject of this memoir. Yet it would be hardly respectful to leave my task without endeavouring to give some idea of the original, though it may prove to be only a rude likeness, drawn by the hand of a friend.

In Dr. Prichard were recognised, of course, all those attributes which belong more or less to men who are distinguished among their fellows by intellectual power. The mere fact of his having been able to produce such works as bear his name, tells what endowments he possessed; but were I to endeavour to present what was most characteristic of his intellect, I should say it was largeness of capacity, united with readiness of command over his resources. All men of powerful minds have strong memories, for memory is the feeder of the other faculties: even if originally robust, these must pine and languish unless maintained by the nutriment which the former supplies. But Dr. Prichard's memory was above the average, even for one of his general mental calibre. His perceptions were by no means defective in acuteness, yet it was not by acute observation that he was particularly distinguished; nor though his judgment was so sound and accurate, should I say that this faculty was so prominent as to be singled from the rest as one of his characteristics. Had he been engaged in the legal profession, I think he would have shone particularly in collecting and methodically arranging, and in luminously and eloquently stating

an immense mass of evidence bearing upon a particular point; not, however, in the spirit of a mere advocate or partisan, but as one whose mind, magnetised by a particular idea, attracted and assimilated to itself every thing that could give support to that idea. It was not a mind to produce a mere agglomeration of facts and notions, but one that impregnated, informed, and organized them all into one living whole. Yet, had he been placed on the bench, I think he would not have been remarkable for mere judicial qualities, such as made Tenterden and Eldon so eminent. Comprehensiveness, rather than subtlety, was the character of his understanding. In conversation he showed his preference to broad decided views rather than to the fine-drawn distinctions, the hair-splittings of metaphysical analysis. Yet in his writings it will not appear that his mind was warped by a foregone conclusion. Few compositions give one a stronger impression of fairness and equity in weighing evidence.

Fancy and imagination were not prominent faculties in Dr. Prichard. He was never at a loss for a suitable illustration to enrich his style, which was affluent as well as terse and vigorous. Yet there was not that conscious enjoyment in the pursuit of analogies and likenesses, which belongs to men in whom the faculties I have adverted to are stronly marked. And, correspondently with this, I think that he had no decided æsthetical tendency, no such sensibility to the beautiful as would lead him to dwell on the enjoyments of poetry and the fine arts; though he was too much of a scholar, and in every way too well informed, not to be able to converse on these subjects. A powerful memory, and a strong philosophical bias, by which I mean the disposition to trace events to their causes, and to classify phenomena under general laws, together with an astonishing capability for undergoing mental labour, will, I think, be found to have been the most distinguishing traits of Dr. Prichard's understanding.

In the moral department of his character, high—nay, highest integrity and honour, and an utter abhorrence of whatever even bordered on the mean and truckling, were united with general benevolence and with strong domestic affections. He was by no means prone to suspicion of motives, and was, perhaps, too easy in the admission of testimony, so that his ears were sometimes open to the first informant on any subject, and he thus might receive impressions which afterwards had to be corrected. The freedom from assumption in his ordinary life and demeanour was very remarkable. The simpli-

city, and all but diffidence of manner displayed in company, where his intellect far overtowered that of others, could not fail to strike observation. He would converse with persons infinitely his inferiors in mind and attainments, as if they were on the same level with him, asking their opinions in connection with subjects upon which he might have dictated to the whole republic of science.

Persons familiar with his works would not be surprised to hear of the prodigious amount of erudition which would come out in conversation. It was no matter how remote the subject might seem to be from the pursuits of a physician; he would unroll such stores of information upon it, as might be expected of a man who had devoted his whole time and attention to it. He was fond of discussion, and would sometimes, for the sake of amusement, support views that were paradoxical, or maintainable solely for the sake of argument; yet he was quite free from dogmatism, or anything like an overbearing tone. If a person of more assurance than knowledge were discoursing or arguing in an unbecoming manner, Dr. Prichard, instead of vehemently assailing him, might ask one or two questions, *more Socratico*, which sufficed to deprive the pretender both of his false position and of his presence of mind; but he would be the first to try to help the defeated out of his disgrace and confusion. Every one left his society impressed, as much by the modesty of the great man, as by the marvellous extent of his knowledge.

As a physician he was distinguished, not only by his extraordinary natural powers, and by the extent of his professional attainments, both scientific and practical, but also by the earnestness with which he devoted himself to his duties, and by his kind and considerate conduct towards his patients. He weighed their symptoms anxiously, and was most conscientious in carrying out the appropriate treatment. He was particularly successful with cases that required a decided uncompromising line of action; and his boldness, consistency, and fearlessness met with their best rewards. Of the little matters of detail that must have their share of attention in many cases, he was rather impatient. He liked in practice, as in other matters, broad views rather than a fine analysis of symptoms and minutiæ of treatment.

In his moral constitution, reverence was very prominent. It showed itself in the value which he attached to the opinions and authority of really great men, and more especially in his sentiments towards the great First Cause. Those who had but very slight com-

munication with him must have felt assured that nothing could ever have proceeded from him disparaging to the interests of religion; and no one knew him intimately, without being aware of the strong influence which piety maintained over his mind, and how it actuated all his conduct. His opinions, during the greater part of his life, were in strict conformity with the doctrines embodied in the book of Common Prayer.

Dr. Prichard was in stature rather below the middle height, and of rather slight make. He had light hair, and grey eyes, which, though somewhat small, were of singularly intelligent expression. The form of his head was very fine; broad and prominent in the forehead, lofty and capacious in the crown. The countenance, to the most superficial observer, betokened deep thoughtfulness, with something of reserve and shyness, but blended with true kindliness. His voice was rather weak and low, but very distinct in articulation. His manners and deportment, as I have already remarked, were simple and unaffected; —and in general company he evidently spoke with effort or even reluctance, unless upon subjects of business or of scientific and literary interest.

His last illness was one of great suffering. A few days before its termination he became conscious that his earthly career was drawing towards its close, and he awaited the event with the resignation and calmness that befitted a Christian philosopher. Though he had not ceased from his labours, nay, the sickle was in his hand when it drooped, few could so well have said, though he would have been the last to say it, "I have not lived in vain." If one could venture in imagination to follow the musings of that departing spirit, one might conceive the satisfaction with which he looked back on his well-spent life. He had not to regret the consumption of precious hours in the pursuit of sensual gratification, nor yet in more refined enjoyment; neither in "lordly ease," nor in "learned leisure." Youth had found him assiduous in acquiring truth and knowledge; manhood and advancing age had witnessed untiring exertions in a profession, which, whatever it may produce to the practitioner, is, if grounded on adequate knowledge, an employment pre-eminently useful to his fellow creatures. And the intervals in those avocations, instead of having been set apart, as they might innocently have been, for recreation and amusement, had been filled up with labours, which, had he done nothing else, would have enabled him to bequeath honour to his family, as the

inheritors of his renown, and lasting benefits to mankind of the highest order; for I know not what gifts can surpass those of truth and wisdom. As the death-shadows began to gather over the spirit, which till it was extinguished could not but be still "looking before and after," the memories of his noble and useful labours might have loomed large before his dimming vision, mingled with recollections of happy hours passed in that loving domestic circle, over which his benign and gentle disposition shed peace and contentment. And one fancies that with such remembrances he might well say, *Nunc dimittis.* But his mind, originally so humble, and so chastened and purified by religious principle, was far more likely to have spent his last moments, not in contemplating what he had done, but what he had left undone; thinking whether he could render a good account of his stewardship of those remarkable talents with which his Maker had endowed him; reposing on infinite goodness; and aspiring to a blessed state of being for which this mingled life of joy and sorrow, hope and disappointment, is but the preparation and discipline. I doubt not that the deeds of his life, which to us look large and brilliant, before *his* failing sight shrank small and dim, and that his soul, which no earthly vision could content, much less the contemplation of his own doings, turned towards that Parent Source from which all his light had been drawn, and longed to be absorbed into its divine and immortal essence. But though, with that true modesty which belongs to the most gifted, because they are the most capable of measuring real virtue and greatness; which led Newton to liken himself to a little child picking up pebbles on the shore of an unexplored ocean; and which modesty, as I have said, was so remarkable in my lost friend, that I cannot choose but dwell upon it;—though he would have depreciated rather than magnified himself, we who look at him from without, and estimate him by the standards that enable men not only to recognize moral excellence, but to mete out the degrees of their approval, cannot refrain from declaring that no spirit could pass more blameless and unstained from its mortal trial, none more fitted for the communion of the great and good, none more ready to appear

> "Before the Judge; who thenceforth bade him rest,
> And drink his fill of pure immortal streams."

SLEEP AND DREAMS.

Two Lectures delivered at the Bristol Literary and Philosophical Institution, in 1851.

I.

OBJECTS of study may be arranged under two great divisions; one consisting of those which must be sought in a wide investigation of external nature; the other of such as are at all times, and in all places, within our reach. The former are spread as far as our bodies, or our senses, aided or unaided, can extend; the latter we carry about with us. The one class are objects of sensation, or outward observation; the other of consciousness and internal reflection;—the world without, and the world within; this embracing the workings of our minds, our emotions, sentiments, affections, and propensities; the other, all the domain of matter and its attributes,—all that exists, whether we are living to observe it or not. Reviewing these two classes, we cannot help being struck with the overflowing provision which they present to our mental cravings; for while, on the one hand, the perceptive faculties have unbounded and delightful exercise amid the sublime and beautiful objects which the Creator has presented to us, in what we call the realms of Natural History, and Physical Philosophy; on the other hand, when by accident confined to narrow limits of space, deprived of one of our senses, or excluded from the objects of these senses, as in the shades of night, or in the solitude of sickness or captivity, we may turn inwards the mental eye, and see the wonders which the same Almighty Hand has fashioned in the mind and heart of man.

Our present subject belongs in some measure to both of the departments of inquiry which I have thus briefly sketched; for our knowledge of it is in part derived from observation of it in other beings.

To know something of that condition in which we spend one-third of our lives, is not an unworthy inquiry. And yet the thought may at first occur to you,—What can be better known than sleep?—a state of which we have all of us common experience. But simple and obvious as it may seem to be, we shall find that the more we investigate it, the more is it productive of topics for interesting and curious speculation, and of questions not very easily answered.

What *is* Sleep? If we attempt to define it in positive terms, we shall find ourselves insensibly wandering among those metaphorical descriptions familiar to us in the pages of the poets, instead of giving an accurate account of its phenomena; for in fact it is a negative state of the living body, and it is only to be correctly represented by the enumeration of various actions which are wanting in that condition, and the presence of which renders a person awake. To sleep perfectly is,—not to see, not to hear, not to smell, not to taste, not to touch, not to speak, not to move; in short, not to exercise one of the faculties which characterize a human being or even an animal. Well, then, may sleep be called "the image of Death," "Death's brother," "so like death," says Sir T. Browne, solemnly, "that I dare not trust it without my prayers." So, too, it was described by Homer,

> "Then gentle slumber on his eyelids fell,
> That deep, sweet sleep, which death resembles well."

In the human body there are two great classes of vital actions. One of them comprehends all that belong to the function of Nutrition, by virtue of which the solid framework is maintained and repaired, and which consists in the continual addition of new particles of matter, and in the removal of those which have become useless. To this class also belongs the circulating function, whereby the materials for the former actions are distributed to the different parts of the body, in the form of blood; also Respiration, a process for purifying the blood, and rendering it otherwise better fitted for the purpose of nutrition; also Secretion, a process by which matters, as in perspiration, are removed from the blood, and by which fluids are formed, which serve important offices in the system.

Now, these several functions, you observe, are all occupied in maintaining the body as a living organic structure, that is, as a

structure distinguished by the actions which have been adverted to, from those structures in which there is no growth, no circulation, no respiration,—bodies which, in a word, are inorganic. Moreover, these functions are analogous to what are observed in the vegetable kingdom, and therefore they are often called the vegetable or organic functions; and as the collection of vital actions is designated the life of the body, so this particular group, of which we have been speaking, is denominated the organic, or the vegetable life of the human body, to distinguish it from another group. This other group comprises sensation, thought and voluntary motion; and as these are possessed only by the members of the animal kingdom, they are called animal functions, and the sum of them the animal life; or, since it is by help of these actions that the animal entertains communications with surrounding objects, we sometimes speak of it as the Life of Relations.

In the state of waking both these lives co-exist, and render each other mutual service. The functions of relation are indicating, through the sensations, certain external means of support for the fabric, while the motor faculties obtain them, and in their turn the vegetable functions are keeping the organs of sensation and motion in a state of efficiency.

But what is the case in sleep? Here we see that the superadded functions which constitute the animal life are withdrawn, and the body, for the time, is reduced to the condition of a vegetable. They are suspended, not extinguished; but there are other states in which extinction of animal life has taken place, though the organic life continues for awhile, as in certain kinds of fatal stupor; that, for example, produced by a poisonous dose of opium. In such irrecoverable sleep animal life is extinct, though the organic may hold out for some time longer.

Ordinary slumber, then, consists in the temporary cessation of the action of voluntary muscles, and their nervous connections, and of the senses. The order in which these are steeped in forgetfulness, those in inertia, is not always the same, nor are they always suspended at the same time.

The phenomena of sleep, as observed by a bystander, are, for the most part these:—The features are relaxed, and give little or no expression, unless of bodily pain or distress, or of the sentiments of a dream, or of some long predominant passion, which has been so often denoted by certain muscles of the face, that these have acquired a fixed

unnatural development from their constant exercise, and thus, even at a time of repose, they produce the semblance of emotions which may be really at rest. Ordinarily, however, the features exhibit no other aspect than that of passiveness. The eyelids are closed more or less completely; but in states of great debility, and especially in children, the closure is imperfect. The eyeballs are rolled upwards, so that the pupils, even in the semi-closure, are not fully exposed to the light; they may, however, be quite open to light, and sleep, nevertheless, occur, though such instances are extremely rare. The ears are not defended from outward causes of hearing in any other manner than by a relaxation of the muscle which keeps the drum of the ear on the stretch, and which is probably used only in the nicer discriminations of sound. Odorous particles reach the nerve of smell, but are not carried into it with that impetus which enables them to be more strongly perceived, and which requires a voluntary effort. Taste is not excited, partly because no substance is presented, and partly because the tongue is not pressed against the palate. The general sensibility of the body is not aroused, for the contact of clothes and the pressure of the chair or couch occasion impressions too slight and too habitual to be noticed. The sense of touch has no stimulus applied to it, for this involves muscular exertion, as in the application of the tips of the fingers.

In one way or other, then, the sleeper is withdrawn in some degree from the agents which affect the senses; but all these conditions may be absent, and yet sleep no less occur, for the only thing essential to this state is torpor of the nerves, or of the nervous centres with which they are connected.

We are generally made aware that a person sleeps by his insensibility to sounds, for the shutting of the eyes is obviously equivocal. If the slumber be light, the slightest touch may awaken him, an impression far slighter than that made by any part of his dress, or by the pressure of his body. This is owing to the novelty of the impression, a quality which always increases its effect; and I may remark, incidentally, that the mere cessation of an impression that was present at the time of falling asleep, may cause the sleeper to awake; thus, a person who sleeps while another is reading often starts when the reader pauses; and this removal of an impression is tantamount to a new impression, since the nerve is put into a condition different from what had existed for some time. The finger may have

been so accustomed to the pressure of a ring that its pressure is unheeded, but let it be taken away, and the wearer is immediately reminded of its absence by the new feeling in the part.

As the slumber becomes more profound, the eye, the ear, and the skin become less impressible; strong light may stream through the semi-pellucid eyelids, loud noises may reverberate, and the individual may be touched, nay, moved, and yet he may not awake.

Not only, as we have seen, are the muscles of the face relaxed, but also those of the trunk and limbs. The muscles which are necessary for respiration continue to act, but their action is independent of the will, though occasionally assisted by it. The relaxation is generally gradual. If the sleeper is in the sitting posture, the grasp of the hand on the book, or any other object, gives way, the body inclines forward, or sideways, or backwards, according to the direction towards which gravitation directs it; the head falls towards the breast, because it is so articulated to the spine that its heavier portion is anterior to the centre of motion. The shock given by this descent of the head often rouses the sleeper sufficiently to make him bring it back to a position more accordant with his rank in the scale of animals; and then the will again slumbers, and the head is again degraded.

On examining the limbs, we notice that they are gently bent. There are two sets of muscles which move the limbs; one set which bend the joints, the other which straighten them; they are technically called flexors and extensors, and they antagonise each other. In sleep the flexors are said to have the predominance; not, however, that this statement is quite correct, for neither set are positively in action. The limbs are found in a semi-flexed position, not because of a continued action of the flexor muscles, but because having been instinctively placed in that position, they remain in it when the muscles are reposing. They are instinctively so placed, in order that the body may rest more easily, because on a more extensive base, when the limbs are slightly bent. Any one will find, when lying down on the side, and trying to rest with the limbs extended, that the points of support for the body are much fewer, and therefore that the pressure on the parts which are undermost is greater than if the limbs are moderately bent.*

* A limb at rest, whether in the sleeping or waking state, is slightly bent. It may naturally be asked, why should not a limb which has been extended remain in that position when the extensor muscles have ceased to act? It appears to be owing to the relative shortness of the flexor tendons, which must date from the processes of growth in the earliest stages of existence, when the continued flexion of the limbs is greater than at any subsequent period.

These remarks on the sleeper all have reference to what I described to you as the Life of Relations, but we cannot close this first superficial study of his condition without noticing the respiration. It is slower than in the waking state, and it is more audible. The latter character depends on the air being drawn through the nostrils only, and with more force, because the inspirations are deeper. Sometimes, as in very profound sleep, the breathing is absolutely laborious ; the cause of which is either that the torpor natural to one part of the nervous system is extended to another which is very near it, and from which the nerves which animate the muscles of respiration derive their energy, or that the state of sleep, combined with the position, has caused such a fulness of the vessels about this part as to oppress its function. In coma, or morbid sleep, this phenomenon is very common. The circulation is also slower, that is, the beatings of the heart are less frequent ; one reason for which is the suspended muscular action in the limbs, for no cause has a greater influence in quickening the circulation than muscular action ; and the mode in which it operates is by compressing the veins, and so hastening the flow of blood through them towards the heart. Also there is, *cæteris paribus*, a direct proportion between the rate of circulation and the respiratory movements. Another fact worthy of notice, as to the organic life in sleep, is that the body is more easily affected by cold. Now, the body resists the action of outward cold, or, in stricter language, is enabled to part with a large portion of heat to the air and other surrounding objects by virtue of its own faculty of manufacturing heat. The animal caloric is formed in greater quantity, in proportion as the respiration and the circulation are more active ; therefore it is not wonderful that during sleep cold should have a greater effect upon the body than during our waking moments. It is probable, also, that there is a direct relation through the nervous force, which seems to be intimately connected with the production of heat.

Digestion and the assimilative function are, probably, more active during sleep ; so also is the function of perspiration ; but I must not dwell upon these points, as we have much before us.

There are provisions for excluding the agents which excite some of the organs of sense. Thus, the eye is curtained by its drooping lids, and the muscle which puts the drum of the ear on the stretch is probably relaxed ; but all external exciting causes may be removed, except the contact of clothing with the skin, or the impression on the part of the body which is reclining, and yet sleep may be absent. The

feeling of wakefulness continues, the thoughts are those of waking hours, and the will is ready to put any resolves into action. And again, on the other hand, the most vivid and violent impressions may be made on the organs of sense without interfering with the accession, or interrupting the course of sleep. The weary gunner sinks into slumber by the side of roaring cannon; the jaded sailor boy drops asleep

> "upon the high and giddy mast,
> In cradle of the rude imperious surge,"

and many an overworn artizan dozes before the blaze of a furnace, or the glare of gas lamps.

There is, then, something more than the mere cessation of external impressions, and more than mere muscular inaction. The susceptibility of impressions, that is the sensibility, is paralysed, and the will no longer acts. The degree to which the sensibility is suspended is often wonderfully slight; for, notwithstanding the individual sleeps, one ray of light falling on the closed eyelids, one faintest foot-fall, may arouse him.

What we have as yet remarked respecting sleep might be learnt from mere observation of the change which this state induces in others, and even in the lower animals; but that which we have next to take notice of could be ascertained only by our own experience of the state, or by the communications of others. I allude to the state of the mind. As we shall have to discuss this topic fully in the next lecture, what I have now to say will only be enough to connect it with the rest of our subject.

All the objects which surround us, and which we perceive by our senses, may be said to be composed of our sensations; for in giving an account of an object we are only able to relate the sensations which it has produced, though we instinctively believe that the existence of these objects, that is of the causes of our sensations, is independent of our own existence. When the objects which cause the sensations are no longer present, they may be remembered; by which we mean, that the sensations may return to our minds. But how do we distinguish these remembered sensations from those which are immediately produced by present objects? In no other way that I am aware of than by their comparative faintness. The recognition of the present outward object, as present and outward, depends upon the liveliness of the image, for a certain degree of vividness seems inseparably asso-

ciated with the feeling of externality, or outness. The object is felt at once not to be a part of ourselves, it is "*non ego*," separate from us, and independent of us. A friend present to our sight produces an image more vivid than any we can at any time call up by an act of memory. Just think what confusion would arise if remembered sensations and present sensations were of equal vividness. The real and the unreal would be intermingled; for as to the subjects under discussion, the real is that which is actually perceived, the unreal, what exists only in the mind. One person is really present, and the light reflected from his body produces a certain impression on the retina, which again excites in our brain, and through it, in our mind, an image which is so vivid as to make us believe instinctively, what is really the case, that he stands before us. But the analogous sensation which the person of another individual, who may be no longer living, once excited in our minds, is at the same time revived; and yet we do not think the latter individual present, though he is perceived by what is called the mental eye. The image is distinct, but it is far less vivid than the former, and indeed than any other object of present sensation, so that the living and the dead are kept separate. This is the state of the case in the healthy condition of the mind and its organ. But the occurrences of disease may alter this relation between present and remembered sensations. The latter may become equally vivid with the former. The person subject to such disorder believes persons to be before him who are not really so, because the images in his mind have, under morbid action, become unnaturally vivid, have acquired the same liveliness as present perceptions, and though revived only in his mind, are projected into the sphere of vision. This is the rationale of apparitions, ghosts, and spectral illusions. And to do away with the objection derived from any other argument as to the reality of spectres, I may remark that the remembered perceptions may be not mere ideas of human beings, but also of the lower animals, and even of inanimate objects; dress for instance, for ghosts are never without drapery. In the disease called "delirium tremens" it is very common for the patient to see ghosts of rats and mice, and spectral swords and guns. Bear in mind, then, this difference in the vividness of perceptions and ideas, and you will better understand what occurs in sleep. Sensations, we have seen, are suspended; therefore the images in dreaming have no sensations to be contrasted with them, and they give the complete feeling of reality. They do not arise with the stamp of the past upon

them, as in our waking hours, and they are combined together in fantastic associations without any control of the will. I am inclined to think that by reason of the diminished action in the part of the brain connected with sensation, there may sometimes be increased action in that connected with the revival of past impressions, in correspondence with a law constantly operating in the human economy, that diminished action in one part causes exalted action in another; but this view is hypothetical.

From this account, then, it appears that when we sleep we not only lose the sensibility to external objects, and the power of volition, but also that ideas acquire such an increase of relative or absolute liveliness as to give all the feeling of reality or outward existence, and, in fact, introduce us for the time into a new world.

I shall now, in order to vary this discourse, remark the different tendencies to sleep in different animals, and in diffent individuals of the human species.

It is probable that all animals pass at some time or other into the state of sleep, since periodicity of action seems a universal property of the functions which characterize an animal. Little is known of the phenomena of sleep in animals which range below the vertebrated classes, and have less complicated nervous systems. Periods of inactivity are with them, perhaps, periods of sleep. Fishes are known to sleep, and Aristotle tells us how they may be surprized in their slumbers. Reptiles often sleep for very long periods, especially serpents, when they have been provided with food enough to last them for several weeks' digestion. Birds take much shorter periods of repose, and the mammalia likewise, excepting those which pass periodically into the state of hybernation, which is a profound degree of sleep. Setting aside, for the present, this state, we may observe that the capability of sleeping for a long period bears a relation to the digestive function of the animal. If it needs frequent supplies of food, those organs which provide it must be correspondingly active. But if a large quantity can be laid up in store, the senses and muscular movements may be suspended during its slow digestion; and this, as we have said, is the case with serpents. Many beasts of prey, which continue watchful for several days, when hungry, will remain torpid for a long time after they have gorged themselves with food. Man, who has a greater power than any other animal of accommodating himself to varying circumstances, has often acquired the habit of long fasts, making large

meals, and spending a corresponding time in sleep. It is one of the accomplishments of the aboriginal civilization of North America to be able to lay in a stock of food for two or three days, and to sleep in long spells, in order to be able to bear long abstinence and watching. There are many curious cases on record of persons capable of long slumbers. "Quin, the celebrated player," says Dr. Macnish, "could slumber for twenty-four hours successively. Elizabeth Orvan spent three-fourths of her life in sleep. Elizabeth Perkins slept for a week or fortnight at a time. Mary Lyall did the same for six successive weeks. In Bowyer's Life of Beattie a curious anecdote is related of Dr. Reid, *viz.*, that he could take as much food, and immediately afterwards as much sleep, as were sufficient for two days."

I cannot leave this part of my subject without noticing the fact that animals give evidence of dreaming. It was not a mere poetical speculation which led that accurate observer of the habits of animals, Sir Walter Scott, to say,

"The Stag hounds, weary with the chase,
Lay stretched upon the rushy floor;
And urged, in dreams, the forest race,
From Teviot Stone to Eskdale Moor."

Lucretius describes the indications of dreaming in the lower animals with great minuteness. He even points out the difference observable in the dreams of dogs of chase from those of the lap-dog.

"Venantumque canes in molli sæpe quiete
Jactant crura tamen subito, vocesque repente
Mittunt, et crebras redducunt naribus auras,
Ut vestigia si teneant inventa ferarum.
Expergefactique sequuntur inania sæpe
Cervorum simulacra, fugæ quasi dedita cernant;
Donec discussis redeant erroribus ad se.
At consueta domi catulorum blanda propago
Degere, sæpe levem ex oculis, volucremque soporem
Discutere, et corpus de terra conripere instant,
Proinde quasi ignotas facies, atque ora tuantur."*

We must all of us have noticed that dogs growl and snap in their sleep, as if angry, and sometimes whine, or wag their tails, as if more amiable emotions were playing over their slumbers. Horses are said to neigh and rear in their sleep; and parrots, the most intelligent of the winged race, are reported by those who have studied them to give unequivocal signs of dreaming.

* De Rerum Naturâ, Lib. iv.

The sleep of animals cannot be dismissed without one or two comments on that remarkable condition called Hybernation. A few animals only, as the hedgehog, the dormouse, the marmot, the hamster, and the bat, are known to pass into this state at certain periods. A great deal of mystery once hung over this subject, and the animal was thought whilst hybernating to have its whole life suspended but not extinguished. The state is now known to be one of profound sleep. And not only are the animal functions brought into a state of complete inactivity, but even those of the organic life are reduced to the lowest ebb compatible with the continuance of vital action. The respiration can scarcely be detected, and the circulation is wonderfully slackened. Thus, "in the hamster the pulse usually beats at the rate of 150 per minute, but it is reduced to 15 in the torpid condition. Marmots, in a state of health and activity, perform about 500 respirations in an hour; but in the torpid state these occur only about 14 times during the same period, and are executed with intervals of four or five minutes of absolute rest, and without any considerable enlargement of the chest."* The bat feeds upon insects, but in winter the insects disappear; therefore the Creator has beneficently arranged that during that season the bat shall pass its time in a deep lethargy, not requiring food, because little or no nourishment is then expended. The hedgehog wakes up after two, three, or four days, and obtains a few snails or worms, if the ground is not too hard. The dormouse may wake every day, for a short time, when it eats a few grains if it can find them, and relapses into sleep. The temperature of these animals falls very nearly to that of the atmosphere, which is a further illustration of how little is the amount of vital action of which they are the subjects. But it is not because they are cold that they become lethargic. The state of hybernation is quite distinct from the torpor occasioned by loss of heat.

We now return to the consideration of sleep in man.

There are different degrees of sleep. It is more or less complete both as a whole, and in its separate parts; for you must have gathered from what we have said, that sleep is a complex state, since the name is given to the hushed condition of the five senses, the suspension of voluntary motion, and that peculiar condition of the mind to which we have adverted. An eminent French Physiologist said,—"Le sommeil

* Dr. Carpenter's General and Comparative Physiology, § 156.

général est l'ensemble des sommeils particuliers." We have seen that there are very different degrees of intensity in the sleep of one sense at different times; but I have now to call your attention to the fact, that one or more senses or faculties may be wakeful, or nearly so, while the rest are profoundly asleep. Thus the organ of hearing is often sufficiently impressible to convey sensations to the sleeper, which are mingled with the ideas of his dreams and suggest new scenes, and often with the greatest rapidity,—so much so, that in the short time which elapses while the noises are occurring, a long period may seem to be occupied by scenes and actions suggested to the dreaming faculties. I remember once in my sleep witnessing what I thought a prolonged storm of thunder and lightning, which I was able afterwards to trace to the light of a candle brought suddenly into the dark room where I had fallen asleep, and to the noise made in opening a door, the lock of which was never turned without a good deal of grating and rattling. Sensations derived from the skin may have a similar effect. The touch or grasp of a person arousing the slumberer, may suggest to his mind images of robbers or enemies, with whom he is struggling. A person having a blister applied to his head, fancied he was scalped by a party of Indians. And a friend of Dr. Macnish's "happening to sleep in damp sheets, dreamed he was dragged through a stream. Another friend dreamed he was stroking a kitten, which in consequence purred most lustily. On awaking, he found that the working of the heavy machinery of a neighbouring mill was slightly shaking his bed, and making the joints produce a sound like the purring of a cat."

By this incomplete sleep, this waking of some of the senses, and the consequent production of impressions which are mixed up with the ideas in the mind, we can easily explain the frightful dreams produced by many disorders of the stomach and other digestive organs.

Some of the most interesting examples of the incompleteness of sleep are met with in the locomotive system. I do not allude to the restless movements of the limbs, or to the change of position often observed in light sleepers, which are more of the nature of instinctive or involuntary actions, than of movements directed by the will. In ordinary and natural sleep, though we may dream of making great muscular exertions both with hands and feet, we are lying quite inert; but when the sleep is less perfect, some of the muscles, through their nervous connections, may awake, and do the bidding of the mental images. A friend of mine awoke one morning desperately clutching

and tugging at the strings of his night cap: he had been dreaming that a viper had fastened upon his throat, and he was doing his best to tear it away. The most common form of this partial sleep is Sleep-talking, in which the muscles of the voice answer to the ideas. A more inconvenient species is the waking of so large a number of the muscles as those which raise the trunk, and enable the person to walk; this is strictly Somnambulism, or Sleep-walking. But there are very different kinds and degrees of it. In the simplest,—that to which I have just alluded,—the sense of sight being still asleep, the person walks straight forward, unconscious of the impediments in his way, and is soon aroused, and very roughly, by coming in contact with obstacles. But in other cases of a more morbid kind, the eyes may be open, objects may be perceived and avoided in the sleeper's perambulations, and yet he may not be awake, for the images in his mind are as vivid as those which he derives from present sensations; and, therefore, the unreal is confounded with the real, as in the case of the ghost-seer, only that in the latter the morbid condition takes its starting place from the waking state instead of from sleep. As an example of the serious consequences of this condition, I may remark that I know of a gentleman who, in this imperfect sleep, got out of bed, walked to the window, opened it, and let himself fall down from three stories' height, doubtless under the illusion produced by the mixture of the vivid conception of a dream, with the actual perception of some of the objects around him. As the ghost-seer views the phantom walking among the living, so this somnambulist, when he opened the window, might have had a beautiful garden spread before his mental eye upon which he thought to step out, instead of incurring a dreadful fall, that nearly cost him his life.

It is quite impossible to attempt entering at all satisfactorily into this subject on the present occasion: but I may give one further instance of incomplete sleep, or partial waking, in the case of a person who talks in sleep, while at the same time the sense of hearing is awake. I have heard that this is so often the case with one person that, by a little skilful management, long dialogues may be held with her while she sleeps. It is necessary to speak in an under tone, or the impressions on the auditory nerves are so strong as to awake her completely; but with this precaution, and by taking the cue from what she has said in her sleep, questions may be interposed to which she will give answers very unreservedly, so that a dishonourable person

might steal from her, in these unguarded moments, the most cherished secrets. On waking, she is quite unconscious of having held these conversations, except as in ordinary dreaming.

Sleep may not only become imperfect after having been complete, but it may also be so from the commencement, in consequence of unfavourable circumstances. Thus a person may fall asleep on horseback; but some of the muscles continue in action sufficiently to preserve the equilibrium, and even to keep hold of the bridle. I have sat by a coachman who was fast asleep as to his senses, but so far awake as to the motor nerves and muscles, that he remained erect on his box, and did not allow the reins or the whip to fall. It is curious to watch, in such cases, the alternation from sleep to waking; thus by a jolt of the coach the driver would awake for an instant, be aware of his condition, give the whip a languid flourish, and then go off to sleep again.

It is, however, well-known that persons may fall asleep even while in the act of walking. This fact was observed among our soldiers in the forced marches during the retreat upon Corunna. The sleep in such cases is partial.

I should, in connection with this department of my subject,—imperfect sleep,—here speak of double consciousness; but before doing so, I must say a few words about waking.

The process of waking, like that of falling asleep, may be sudden or gradual; the latter is, perhaps, the most natural change. If we watch a person undergoing it, we may observe him first moving his limbs, then changing his position, then opening his eyes, which however he may close again, and relapse into sleep; then speaking some incoherent matter, as it seems to us, but no doubt rational to him, and conformable to his dream; then he gives a sort of answer to some question we have put, but still wide of the mark; then there is a second opening of the eyes, a stare, a sudden burst of the truth of things, as it seems to us, but to him the exchange of one reality for what was, a moment before, reality to his apprehension, though he now acknowledges that it was all shadowy and fanciful; then he stretches his limbs, that is, puts them from a state of flexion into one of extension, yawns, perhaps, and says he is still weary, and must sleep again:—

"The messenger approaching to him spake;
But his waste words retourned to him in vaine;
So sound he slept that nought mought him awake.
Then rudely he him thrust, and pusht with paine,

Whereat he 'gan to stretch; but he againe
Shooke him so hard, that forced him to speake.
As one then in a dreame, whose dryer braine
Is tost with troubled sights and fancies weake,
He mumbled soft, but would not all his silence breake."
SPENSER, C. 1, 42.

But in other cases the transition from sleep to waking is sudden; it may be so from a strong desire present when we fell asleep to do something important after rising, which desire recurs to the mind immediately on waking. But sometimes the transition is quick, merely because the sleep was very light. The individual is sometimes unconscious of having slept; after very deep sleep, for instance, when the dreams were so feeble as not to be remembered. When he has slept pretty soundly, he is generally conscious of having done so by the great change of the waking sensations. If his sleep has been uneasy and imperfect, he often denies that he has slept at all. He has been in a quick alternating succession of sleeping and waking states. The sleeping states have been so mixed up with outward sensations, and the waking states have had so much of drowsiness in them, that when he is fairly awake he entertains a strong impression that he has been awake the whole time. The waking impressions run into each other, and give the idea of uninterrupted continuity. Thus, I remember once sleeping uneasily in the house of a medical friend, whose night-bell rang three times in the course of the night, and in the morning I could hardly be convinced that there had not been an incessant ringing of bells the whole time.

Often we awake, feeling very weary. This may arise from excess of mental action in dreaming, and from unpleasant feelings. But sometimes it is only a residual torpor in the nervo-motor apparatus, which goes off as soon as we are out of bed. At other times, however, it is real languor dependent on the want of nourishment, and is removed immediately by food. Some persons sleep more in a given time than others: that is, the sleep is more complete, and the refreshment, consequently, more decided.

The mental invigoration is sometimes very remarkable. Difficulties which posed the individual when he fell asleep are now resolved in an instant. In Sir W. Scott's Life it is mentioned, that after composing a great number of verses over night he would sometimes come to a point beyond which he could not advance a step;—a refractory rhyme, an entangled plot, or some other poetic stumbling-block. In such

cases he used to give the matter up, confidently expecting that on the following morning he would be able to surmount the obstacle before leaving his couch; an expectation which was scarcely ever disappointed.

Schoolboys used, in my time (I know not what they do now with modern improvements), to con over their lessons immediately before lying down, and on waking the task would be fresh and clear in their memories. It is surprising how rapidly one returns after a sleep, though it may have been spent in the busiest dreaming, to the train of thought that immediately preceded it. On awaking in the morning we take up the thread of a speculation just as we had left it on the mental distaff, when seduced into weaving thoughts of "such stuff as dreams are made of."

I now return to the consideration of double consciousness. We have seen that the apparatus of speech may awake and act in correspondence with the ideas of the dream only, or with those suggested by sounds, the sense of hearing being also awake; and also that the locomotive apparatus may be in action without the sense of vision, as in the case of the somnambulist who comes in contact with outward objects; or with a complete power of vision. This latter state abuts immediately on the present topic. The person sees, hears, walks, has, in fact, the ordinary attributes of the waking state, and yet is not awake. He may pass from that condition into ordinary slumber, and then wake up like other people; or the transition may be from the morbid condition to the ordinary waking state without intermediate sleep. This is double consciousness.

Of this state I shall adduce two instances. The first is related by Professor Silliman, and quoted by Dr. Prichard. "A lady of New England, of respectable family, became subject to paroxysms, which came on suddenly, and after continuing an indefinite time, went off as suddenly, leaving her mind perfectly rational. It often happened that when she was engaged in conversation she would stop short in the midst of it, and commence a conversation on some other subject, not having the remotest connection with the previous one; nor would she advert to that during the paroxysm. When she became natural again, she would pursue the same conversation in which she had been engaged during the lucid interval, beginning where she left off. To such a degree was this carried, that she would complete an unfinished story or sentence, or even an unfinished word. When the next

paroxysm came on, she would continue the conversation which she had been pursuing in her preceding paroxysms; so that she appeared as a person might be supposed to do, *who had two souls*, each occasionally dormant, and occasionally active, and utterly ignorant of what the other was doing."

The second example was published by Dr. Dyce, in the Edinburgh Philosophical Transactions, and is quoted by Dr. Abercrombie. "The patient, who was a servant girl, was first attacked by fits of somnolency during the day, which came on with a cloudiness before her eyes and a pain in her head. In these fits she talked of scenes and transactions which appeared to be as in a dream, used to follow her occupations, dressed herself and the children of the family, and laid out a table correctly for breakfast. Being taken to church during the attack, she behaved properly, evidently attended to and was affected by the preacher, so as to shed tears. During the attack her eyelids were generally half-shut; her eyes sometimes resembled those of a person affected with amaurosis, that is, with a dilated and insensible state of the pupil, but sometimes they were quite natural. She had a dull, vacant look, but when excited knew what was said to her, though she often mistook the speaker: it was observed that she discerned objects which were but faintly illuminated. The paroxysms generally continued about an hour, but she could be roused out of them; and then she yawned and stretched herself, like a person awaking out of sleep. At one time she read distinctly a portion of a book that was presented to her, and she sang much better than in the waking state."

Dr. Abercrombie thought that no explanation could be found for these cases. It might, therefore, seem rather presumptuous if we were to attempt anything of the kind: but we shall venture on one or two remarks which may tend to elucidate the subject.

The healthy waking of the mind is the resumption of the form of consciousness which existed previously to sleep. The objects before the eyes have the same aspect and the same associations; the thoughts return to the same channel; the occupations of the previous day, and those projected for the ensuing day, are remembered, and there is no confusion of personal identity. But a man may awake up to the outward world, and that world is all changed to him. His eyes are open, and his ears catch every sound, and he can feel and handle. But, alas! how delicate and fragile a thing is perception! All has gone wrong. He is awake, and he looks around his chamber in which he

has every day, for years, hailed the morning sunshine. It has once more lighted up his household gods; and dear familiar faces are anxiously bent on those eyes which look, and yet have no speculation in them; and gentle voices hail, and condole, and soothe, and number up many a word and name, which but the day before would have been key-notes to his heart's sweetest harmonies; but all is now jarred and "jangled out of tune." He looks out on a new world projected from his own inner being. By a melancholy power, a fatal gift, of appropriating and assimilating the real objects perceived by his senses, he takes possession of them, nay, disembodies them, and fuses them into his imaginary creation. And as for those beloved beings who fondly think themselves linked with all his strongest and most tender memories, he takes no more note of them than as they swell that strange fantastic pageant which floats before his bewildered fancy; they are mere *dramatis personæ* in the mad farce or tragedy which his poor brain is weaving. They are all shadows; no more the dear flesh-and-blood realities of his heart; they are metamorphosed into the unsubstantial figments of a distempered imagination.

What is the explanation of all this? It is, that all things relatively to the percipient mind *are* as they *seem* :—

"Nothing *is*; but all things *seem*."

For to seem, is to be seen in a certain relation. No outward sensation is perfectly isolated; it is always connected with some other, past or present, from which it may take, or to which it may impart its hue, and tone, and character. Perception, as distinguished by metaphysicians from sensation, is resolvable into this. The individual we have been describing is awake, but awake with a new consciousness. In the morbid state of his brain, ideas (using this word as representative of the results of internal operations of the mind, as distinguished from those received from without,) have so undue a vivacity and preponderance, that outward objects are no longer viewed in their former associations; they are made subordinate, and mere appendages, as it were, to the internal changes. It is a frightful excess of what, to a certain extent, is often taking place in healthy but powerful minds, which impress their own individuality on the external world. The speculative philosopher who views outward objects in relation to some comprehensive theory elaborated in his own mind, to which he fits all that he sees and hears, is the subject of a somewhat like process of

thought. So, also, is the creative artist, who does not content himself with barely imitating nature, but who looks at nature through the media of his peculiar faculties, and, having invested the objects with a beauty and sublimity derived from his own mind, represents them with those forms and colours on the canvas or marble. His own subjectivity is first thrown upon the outward world, and then by his art made objective to other eyes.

From these and like considerations, we can better understand the phenomena of double consciousness. In this unusual state, the individual, though awake, perceives objects only in relation to the new phase of the mind, which has lost its habitual memories, and emotions, and sentiments, and is the temporary subject of a different group,—so different, that they change for the time the mental identity; for identity is the *me*,—the *ego*, around which remembered objects and ideas are clustered, while they are at the same time interpenetrated with an infinite variety of emotions and sentiments, and harmoniously mingled with present perceptions.

What, then, is the test of healthy waking or consciousness? To the individual himself, one state is as healthy as the other; but we, observing him, take a different view. Our test is the correspondence of his perceptions with our own, or with those which ordinary people receive from the external world. Common opinion is the necessary standard. Anaxagoras was thought mad when he told his countrymen that the sun was larger than the Peloponnesus. They could not follow his process of thought; their minds were not as his mind, nor their knowledge as his knowledge; therefore, to them he could not but seem insane. And here we cannot help remarking how extremes meet. The sublimest speculations, and even inspirations, seem to lie on the very brink of delirium. In uncivilized nations, the madman has often been venerated,—not merely as one under the stroke of heaven,—but, also, as one having mysterious access to wisdom withheld from the generality of mankind. But setting aside the rare cases in which one man is wiser than all the world beside, if a person sees the outward world in an entirely different aspect from that of other people, he is unsound.

The double consciousness, then, is only the alternation of healthy and morbid conditions of mind (lucid and insane oscillations), even though in the morbid state there may be achievements of memory and the other mental faculties not attained to in the waking condition.

You will not, I dare say, regret to pass from the clear-obscure of metaphysics into the broad day light of matter; for we have now to speak of the central nervous organs in reference to sleep.

You are probably aware that there are two kinds of nerves; those of sensation, and those of motion. Of the *sympathetic* nerves we have no occasion to speak. The nerves of sensation are connected, either directly, or through the spinal cord, with certain portions of the brain called the sensory ganglia, the chief of which are the corpora quadrigemina and thalami optici. To these centres of sensation are conveyed the impressions made by outward agents, and here they probably become objects of consciousness.

The nerves of motion communicate with the spinal cord, the medulla oblongata, the corpora striata, and the cerebellum.

The sensations formed in the sensory ganglia are transmitted to the hemispherical ganglia, otherwise called cerebral lobes, or brain proper. Here they may be reproduced in the process of memory, and become the materials of those complicated mental operations which belong to imagination, abstraction, reasoning, &c., or be associated with the emotions and higher sentiments of the soul.

The corpora striata are the centres of volition, and the ideas or wishes generated in the cerebral lobes are carried into effect by the nerves of motion, through the impulses transmitted from the corpora striata to the spinal cord. But there is a close relation between their action and that of the cerebellum, which is the organ whereby the complicated motions, and probably the feelings of equilibration, are co-ordinated in standing, walking, running, &c.

The medulla oblongata is the centre of those important nerves which govern the vital acts of respiration, as well as of those employed in deglutition.

The spinal cord, or series of spinal ganglia, so far as it is an independent source of action, and not a mere conductor of impressions from the nerves of sensation, or of impulses from the centres of volition, is subservient to the functions of the organic life.*

Having sketched thus briefly the chief divisions of the nervous centres, we can point out their connection with sleep. In healthy or perfect sleep, action is suspended in the sensory ganglia, the corpora striata, the cerebellum, a considerable portion of the hemispherical

* These anatomical explanations were facilitated by reference to some excellent diagrams drawn for me by my friend, Dr. Brittan.

ganglia (some portion being employed in dreaming), and those parts of the spinal cord which are used in the transmission of sensational impressions or volitional impulses. The medulla oblongata must not sleep, or respiration would stop. Yet it is probable that between the respiratory movements there are pauses in the action of this nervous organ, like the repose of the heart between its diastole and systole; but there is no such continuous cessation as corresponds with what we understand as sleep.

Of imperfect sleep the most common form is sleep-talking. The nerves which animate the vocal muscles are awake, and answer to the ideas and emotions produced in the hemispherical ganglia. In simple sleep-walking, or the minor degree of somnambulism (the senses being still asleep), the cerebellum is awake, and perhaps also the copora striata in some degree, and the related portions of the spinal cord. But in that form of somnambulism in which the subject of it sees and hears, though under the influence of the dream, the parts awake are the sensory ganglia, the corpora striata, portions of the cerebral lobes, the cerebellum, and the related portions of the spinal cord. The difference between this state and that of the ordinary waking condition belongs to the pyschological actions connected with the hemispherical ganglia.

But what is the change that takes place in the nervous centres when their action is suspended? A difficult question; difficult because the mode in which nervous matter subserves its functions is but very imperfectly known. In other words, we know but little of the nature of that action, the remission of which is sleep. Yet all analogy intimates,—and actual investigation confirms the hint,—that in the active state there is a certain intercourse between the blood and the minute structure of the part, whereby something from the blood is consumed and the nervous matter undergoes chemical transformations. This occurs in all vital action; and the economy of the frame is such, that this expenditure, or elaboration, is not going on at the same time in all parts of the body. In excessive action of any of our organs there is a drain on the rest of the system, so that if the emotions and the will, or strong outward causes of excitement, keep the sensory and hemispherical ganglia at work, when they ought to rest, not only must these organs suffer, but the whole body must be more or less deranged. Of course I am aware that many frames feel this much more than others. But that in the waking state, unduly prolonged, there is a

great consumption, not only of what we vaguely call *power*, but also of real material, is obvious from the fact that considerable loss of flesh will ensue, and to an extent greater than can be explained by mere derangement of the digestive functions. And, on the other hand, in those who indulge too freely in sleep there is a manifest tendency to plethora and obesity. Recent chemical researches have proved that "sensation, motion, and thought are as closely connected with certain processes of oxidation going on in the body, as the light and heat of flame are connected with the oxidation of the burning materials; and also that narcotic vapours, like chloroform and ether, have the effect of retarding, or arresting, these processes of oxidation."* In sleep, then, there is a spontaneous suspension of those changes. You will not infer from these remarks that cerebral functions are mere chemical processes; but only that these are the physical changes in the parts instrumental to the operations of the immaterial principle.

The nearest approximation, then, towards an answer to our question is, perhaps, this;—that natural sleep is the result of exhausted action in certain portions of the nervous system; that time is required for refitting the materials of the nervous structure itself, that is, of the matter which is to be oxidated, as well as for recruiting the blood; and that no more intercourse can take place between the blood and the specially vital function of the nervous matter, without the consumption of what is required by other parts of the body.

But though this is the ultimate change in natural sleep, the sleeping condition may be induced with but a very small degree of such change, by the mere influence of subsidiary circumstances,—some of which, like narcotics, are altogether artificial, while others may be reckoned as natural auxiliaries.

Of these we have now to speak, and the first that I shall notice is vascular pressure. It is familiarly known that compression will benumb the sensibility of a nerve, as in a limb resting on the edge of a hard seat. Analogy would lead us to expect a like result from compression of the nervous centres. But independently of analogy, we know it to be the fact from various circumstances. Thus, a man had lost a portion of his skull by an accident, and the brain, being only covered by soft parts, could be easily subjected to pressure; and at any time he could be sent to sleep by gentle pressure of the finger on this portion of the head. Again, there are certain diseases in which

* Dr. Snow on the Action of Narcotic Vapours.—Medical Gazette, April, 11, 1851.

the brain, pent up in its bony case, is liable to pressure. It may be from excessive fulness of the blood vessels themselves, constituting one kind of apoplexy, which is the extreme of morbid sleep; or it may be from blood poured out of a ruptured vessel into the brain or its cavities; or it may be the increase of a thin fluid, called the cerebro-spinal fluid, which fills the cavities of the brain, and surrounds its outer surface, as well as that of the spinal cord. The morbid accumulation of this fluid is "water on the brain," and the existence of the disease is often denoted by extreme somnolence, which passes into what is technically called *coma*, that is complete insensibility.

From facts of this kind, then, it may be urged that as sleep resembles these states, and is indeed a minor and transient form of that abolition of cerebral functions which belongs to them all, it is probable that sleep has a like causation, and that before its accession a certain amount of pressure takes place in the brain. This seems still more probable, when we observe that people are prone to drowsiness if the system is plethoric, and, also, that *recumbence* is the natural inducement to sleep; the effect of lying down being to retard the return of blood from the head, and so to produce some relative fulness of the vessels. This state, however, is not essential to sleep, for persons may slumber in the upright posture, though few can do so soundly. There is, then, very abundant reason for believing that a moderate degree of pressure on the brain is a natural disposer to sleep. But this fact has been so strongly pressed on the minds of two physiologists, that they have imagined that there is a special provision for the production of vascular pressure. Thus Dr. Osborne, of Dublin, in a very ingenious paper published some years ago,* endeavours to show that the choroid plexus is the organ of sleep. Now, the objection to this view is, that there is no proof that these vessels are particularly distensible or susceptible of any such degree of fulness as to warrant our supposing them to have this function, though their situation, lying as they do upon the sensory ganglia, seems to me to be favourable to Dr. Osborne's hypothesis.

Dr. Marshall Hall, to whom the modern physiology of the nervous system is so much indebted, had a notion that a spasm occurs in the deep-seated muscles of the neck, before the supervention of sleep; and that the muscles in this contraction compress the veins, and so produce a temporary turgescence of the vessels of the brain. But it is yet to be proved that this occurs as one of the antecedents of ordinary sleep, however true it may be as to morbid conditions.

* Medical Gazette, June, 1849.

We now pass on to the consideration of other circumstances favourable to sleep. After what we have said about the proximate cause, it is almost superfluous to remark, that one of the natural antecedents is a certain amount of exercise of the brain. Its repose is the consequence of its exertion. But in different individuals we observe great differences, as to the amount of exertion necessary to induce this tendency to inaction. Some have so sluggish a nervous system, so little propensity to spontaneous action, that if they are only not stimulated into wakefulness, they are perpetually dozing. In others, the nervous activity is so marked, that it is only after strong and prolonged exertion of mind that sleep visits their eyelids. Minds of equal capacity, acuteness, and vigour, may vary extremely in their capability of sustaining labour and diminution of repose. Those who enjoy a very robust cerebral organization, require a greater amount of mental labour to tire them down sufficiently for sleep; and they are refreshed by an amount of sleep quite inadequate to the wants of others. It is impossible to lay down a law inclusive of all individualities in this particular. I have known a person of very active mind and literary habits unable to sleep when leading the life of a sportsman, simply because, though he was fatiguing his muscular system, he had not worked the percipient and reasoning parts of his brain sufficiently; so that when his limbs were at rest in bed, his brain did not choose to take the same time for repose. It had been slumbering all day. I need not remark that this individual enjoyed an unusual degree of cerebral activity. Many a weary statesman and philosopher would sleep under like circumstances, the brain being ready for slumber whenever it has an opportunity. But there is an altogether different result of successive mental fatigue not unfrequently met with. In common language, a person goes to bed too weary to sleep. In this state, the overaction of the organ continues; it cannot pass into the natural alternation of inactivity, and it is probable that the cause is to be found in the local circulation. Blood having been attracted to the brain with too much vehemence, and for too long a time, the self-adjustments with which the vessels are provided cannot come at once into action. The vessels cannot at once resume their former dimensions, and the flow through them continues in the same quantity. We see this in other parts of the body. If the eye has been subjected to an inordinate amount of light, and for too long a time, the vessels which had been unduly injected remain in this state for some time after the light has been withdrawn. Or without taking the vessels into account,

we have another proof of the same thing, in the luminous impression which remains on the retina.

And here I may remark, as a convenient place for the observation, that the brain, like the optic nerve, does not readily part with impressions of great vividness, so as to lapse into sleep; or if sleep does come on, the ideas still continue unaltered. How common it is for persons to say that they have been too much excited to sleep. New company, intensely interesting conversation, new sights, unexpected intelligence, &c., are all sufficient to prevent the accession of sleep, by reason of the unusual vividness of the impressions,—the vividness being dependent on their nature, or their degree, or their mere novelty; a new impression being *cæteris paribus*, more vivid than one repeated. A person cannot sleep away from home. This may generally be traced to the fresh objects and impressions. But some aver that they cannot sleep in a strange bed, without reference at all to the preceding or accompanying circumstances, or to the comfort or discomfort of the bed; and I do not disbelieve them. The sensibility of some persons is no measure for that of others, as to the corporeal functions, any more than as to mental conditions. A new bed may, in its arrangements, make a number of new impressions on the cutaneous nerves not possible to be individually specified; but, in the aggregate, bringing an amount of new and vivid sensation to the brain, incompatible with the supervention of sleep.

To return. For natural sleep, a certain wholesome amount of cerebral fatigue is necessary. To enter upon all the auxiliary or interfering agencies would take me into a discussion far too protracted; and I am treating the subject in its scientific, rather than in its practical aspects. A very few words may suffice.

The effect of posture was touched upon when we spoke of the blood vessels, in relation to the nervous centres. I shall now add, that general plethora tends to somnolency by the pressure on the brain, and that this must not be confounded with the effect of excited capillary circulation, which causes excessive functional activity of the brain, and sometimes obliges the subject of it to support the head on higher pillows than what are ordinarily used.

The influence of food is matter of common remark, and, at first sight, seems to be beset with many anomalies and incongruities. Early dinners or late dinners, supper or no supper,—these have their respective advocates. To me the truth of this matter is comprehended in a small compass. During the process of digestion, the brain, unless

stimulated by alcoholic liquids, is disposed to quiescence by that law of balance of function to which I have already adverted. There is a diversion of vital energy (through the nerves and blood vessels), from the brain to the stomach. Sleep in this state is natural, and comports with what we observe in the lower animals. Yet we must take care not to rush at once to the conclusion that it is well to take a nap after dinner, and to eat a good supper before retiring to rest. Our whole mode of life, in modern civilization, has become so artificial, that there is need of constant compromise and conciliation. No rule can be laid down without a knowledge of the health and habits of the individual. Digestion is sometimes absolutely disturbing to sleep. When it is accomplished with difficulty, morbid impressions on the nerves of the stomach reverberate in the brain, keeping it awake, or suggesting strange or even miserable dreams. On the other hand, the nerves of the stomach instead of fretting over their work, may be unhappy for want of occupation, and their cravings also echo in the brain, and disquiet that noble organ! Or without these importunate complainings from the stomach, the brain goes on working, simply because it is enjoying a monopoly of vital energy, while the other has no employment. The very heavy and all but apoplectic sleep of those whose hands have been too generous to their mouths, has its cause in the pressure on the brain, induced by the over-filled blood vessels, to say nothing of the direct narcotic influence of some of the ingredients. But this is a subject too humiliating to the higher part of human nature to deserve consideration in the transactions of an institution devoted to Philosophy, Literature, and the Fine Arts, and therefore I shall say no more about it!

Though sleep is usually promoted by the absence of light and sound, a certain amount of either may be necessary. A person accustomed to a light in the room, may be unable to sleep without it,—nay, to awake if it is withdrawn. And wakefulness may be induced by the subsidence of an accustomed noise; the habitual loss of the impression on the sensory nerve being tantamount to a new impression, because the nerve is in an unusual condition.

But some sounds are absolutely lulling. Unvarying sounds are generally so;—"the droning flight" of the beetle; the "drowsy tinkling" of the sheep-bell; the rippling of water; the sighing of the wind among trees and sedge; the deep boom of the sea; or, as old Burton says, "to have a basin of water still dropping by one's bedside, or to lye near that pleasant murmur, *lene sonantis aquæ*, some

flood-gates, arches, falls of water, like London bridge, or some continual noise which may benumb the senses."

This effect is prettily described by Spenser :—

"And more to lull him in his slumber soft,
A trickling stream, from high rock tumbling downe,
And ever drizzling rain upon the loft,
Mixed with a murmuring winde, much like the soune
Of swarming bees, did cast him in a swoune."

C. I., Stanza 41.

Not only undulating sounds, but also undulating sights conduce greatly to sleep. Those regular and almost rhythmical movements of the hands before the eyes, sometimes practised by magnetizers, have a stupifying effect, and induce sleep, though it is usually of an imperfect kind, like that of the somnambulist, and, as such, productive of strange phenomena in the nervous system, which prove very exciting to the speculations and fancies of those who delight in mysticism. Gentle friction of the skin, inducing, as in the other cases, a succession of uniform impressions, is also very sedative.

Dull monotonous thoughts suggesting no lively images, no sallies of wit, no "fancies fine," no manœuvres of reasoning, should be encouraged by him who is anxious for sleep. Let him read or listen to a stupid author, not stupid enough however to irritate him, or let him count by simple numeration, or say over to himself some droning rhyme.

"Oh ! dearest lady, rest your gentle head
Upon my lap, and try to sleep awhile ;
Your eyes look pale, hollow, and over-worn
With heaviness of watching and slow grief.
Come, I will sing you some low, sleepy tune,
Not cheerful, nor yet sad ; some dull old thing,
Some outworn and unused monotony ;
Such as our country gossips sing and spin,
Till they almost forget they live."

These different methods of inducing sleep have all one element in common, that of annulling the sensibility of a nerve, or a portion of the brain, by the mere repetition or, rather, the continuance of a single impression, or of a single group of impressions.* The retina kept by

* The following method of procuring sleep at will is recommended by Dr. Binns. —(*Anatomy of Sleep, p.* 435.)

"Let the patient turn on his right side, place his head comfortably on the pillow, so that it exactly occupies the angle a line drawn from the head to the shoulder would form, and then slightly closing his lips, take rather a full inspiration, breathing as much as he possibly can through the nostrils. This, however, is not absolutely necessary, as some persons breathe always through their mouths during sleep, and

a strong act of the will fixed on a particular point, will become temporarily blind; and by that wonderful sympathy so marked in the nervous system, the inaction so induced will extend to the other parts of the sensorium, and the individual will fall into what Mr. Braid calls Hypnotism. The continuance of one unvarying sound, as we have before remarked, has a like effect. Between the repetitions of the sound there must not be an interval sufficient for the recovery of sensibility in the nerve, else the effect may be quite reversed. Thus, I remember a lady told me that one kind of sound which old Burton speaks of, had anything but a soothing influence. I had directed her to take a shower bath before getting into bed. Some of the water left in the reservoir dripped into the tin vessel at the bottom. At first, she thought this sound would lull her; but the intervals were too long. She was either nervously expecting the next drop, or, when it came, it came as a new impression, and roused her up; so that, as she said, instead of sending her to sleep, it drove her almost mad. There must, then, be a certain continuity of sound. And the same applies to all images in the mind. I have found nothing answer better than imagining one's self floating on a vast expanse of water; or, trying to image to one's self the Pacific Ocean, and fancying we are sailing upon it, while

> "The sky and the sea, and the sea and the sky,
> Lie like a load on the weary eye."

It is interesting to observe that whenever the poets are engaged in describing the objects around sleepers, they not only by their instinct or inspiration assemble objects more or less fixed and unvarying in form and hue, together with motions of great sameness, but their very

rest as sound as those who do not. Having taken a full inspiration, the lungs are then to be left to their own action, that is, the respiration is neither to be accelerated nor retarded too much; but a very full inspiration must be taken. The attention must now be fixed upon the action in which the patient is engaged. He must depict to himself that he sees the breath passing from the nostrils in a continuous stream, and the very instant that he brings his mind to conceive this apart from all other ideas, consciousness and memory depart; imagination slumbers; fancy becomes dormant; thought ceases; the sentient faculties lose their susceptibility; the vital or ganglionic system assumes the sovereignty; and, as we before remarked, he no longer wakes, but sleeps. For the instant the mind is brought to the contemplation of a single sensation, that instant the sensorium abdicates the throne, and the hypnotic faculty steeps it in oblivion. It will happen, sometimes, that the patient does not succeed on the first attempt. But he must not be discouraged. Let him persevere, taking in full inspirations and expirations for thirty or forty times, without attempting to count them, for if he does, the act of numeration will keep him awake; and even should he not succeed in inducing very sound sleep, he will, at least, fall into that state of pleasing delirium which is precursory of repose, and which is scarcely inferior to it. Many trials have satisfied us of this."

metre falls into monotony, or the repetition of like sounds. Thus, Tennyson, in the "Lotos Eaters":—

"'Courage,' he said, and pointed to the strand;
'This mounting wave will roll us shoreward soon."
In the afternoon they came unto a land
In which it seemed always afternoon;
All round the coast the languid air did swoon,
Breathing like one that hath a weary dream;
Full-faced above the valley stood the moon;
And, like a downward smoke, the slender stream
Along the cliff to fall, and pause, and fall did seem."

But all corporeal or physical auxiliaries,—darkness, or a soft subdued light,—silence, or lulling murmurs,—the langour of gentle fatigue,—a well-adjusted couch,—a familiar chamber,—and a sound digestion,—all these will be of no avail if he, who courts the oblivion of slumber, lies down under the sway of some strong emotion. The mere intellect may yield up its most favourite speculations or remembrances to the sleepy time and influences; but the passions are not so easily hushed, and their vigils are extended to every part of the system. The throbbings of the heart,—the pantings of the respiration,—the watchful ear,—the searching eye,—the tortured memory,—the busy fancy,—the harassed judgment,—all give tokens of the spell by which they are bound:—

"Not poppy, nor mandragora,
Nor all the drowsy syrups of the world,
Shall ever medicine thee to that sweet sleep
Which thou own'dst yesterday."

Therefore, he who would sleep well should join in the prayer of Dr. Johnson, for

"Obedient passions and a will resigned."

Add to these the calming influence of a conscience void of offence towards God, and towards man, and we are in possession of the best mental preparation for gentle slumber. "When Ptolemy, king of Egypt," says an old writer, "had posed the seventy interpreters in order, and asked the nineteenth man what would make one sleep quietly in the night, he told him the best way was to have divine and celestial meditations, and to use honest actions in the day-time."

Our last question is, What is the final cause of sleep? Why should the senses and voluntary motions be suspended? Why have they not been allowed to continue uninterrupted, like the pulsations of the heart, and the action of other organs? But, after all, no organs of

the body are really sleepless. The heart, in the midst of its seemingly continuous pulsations, has its halt. The lungs rest at the end of every expiration. The stomach is not, or ought not to be, always at work. The great difference is, that while the organs of the vegetable life take their repose in snatches, frequently returning, those of relative life have long spells of sleep, and then uninterrupted work. But without dwelling on this view, it would be easy to shew that were sleep abolished, the whole economy of the body would require to be altered. Were the nervous organs of sensation and voluntary motion to continue in unslackened exercise, they must have a corresponding supply of blood; but as that which must then be expended upon them could not be applied to the wants of other organs, as is now the case in sleep, a greater quantity of blood must be formed. This requirement must entail a change in the dimensions and qualities of the blood vessels, in the propulsive powers of the heart, and a change in the apparatus of respiration. But the formation of the increased quantity must engender the need of increased digestion and assimilation; and the organs devoted to these functions would require an increase in their extent and endowments, not only for their greater amount of function, but also because they would no longer perform it under the present favourable circumstances, incident to the state of repose. Many other illustrations might be given of the disturbance which must occur in the whole of the present system. Supposing, however, that such a change were effected, and the animal organization moulded on an entirely new plan, how would it stand in relation to the circumstances in which it exists? More food would be required; and, in many cases, this is by no means more than adequate to the present need of both man and animals. More air must be consumed. And it is questionable whether, to the supposed sleepless organisms, the present density of the atmosphere and proportion of oxygen would be adequate. Whether such consumers, and, I might add, vitiators of air could be as gregarious and social, might be doubted. But without dwelling upon any other arrangement of external nature than that of darkness, this surely would be enough to shew the harmony subsisting between the sleep of animals and the media of their existence. For the exceptions in the case of predatory mammalia, or of animals which in their burrows and caverns have, even in the day-time, a night spread around them, are trifling in comparison with the hordes that toil and bask and sport in the sunshine. How would the hours of night pass to animals capable of sense and motion, yet debarred from

the exercise of them, and having no such resources as belong to reflective man under similar circumstances? But not to press the argument further, we might ask what would be gained by this ever-vigilant state? It may be suggested that there would be more time for man to work in, to do his mighty deeds, to realize his visions of glory and his schemes of benevolence. For the lower animals,—more time to feel the pleasures of their limited existence, and to enjoy the exercise of such faculties as they possess. But, is the feeling of existence in these beings always one of pleasure? Are their powers always exerted with delight? Would it be a gain to the timid deer, that their fleetness should unceasingly be called into action to elude the chase of the sleepless wolf? Would it add to the happiness of the gentle dove, to expect the downward swoop of the hawk in the night as well as day? And are man's thoughts so free from evil, that they could be trusted to engender actions all the livelong hours? Surely it is better that the hand of the violent man should be stayed by sleep's soft compulsion. Better that the busy, plotting brain, devising mischief, should be caught and entangled in its own dreamy meshes. Better that the lips of the tyrant should be sealed for a few hours, for mercy instead of doom may drop from them after the night's calm and refreshment. Better that the world should have a respite, if not a reprieve, from the horrors that await the waking of armed men. It is something gained if only a few hours are saved before the sky is red with the light of flaming cities, and the air afflicted with groans and wailings, and curses and war-cries.

But we need not contemplate sleep as the mere interruption of deeds of crime and scenes of violence. Its associations have more of gentleness than of terror. To sleep is to pause from the hurrying whirl of life; to rest after all its toil, and struggle, and agitation; to see no sights of pain and grief, and "all the ill things that are done i' the sun;" to hear no sighs, "no stifled sobs, no loud lament;" to forget all cares, and losses, and heart-aches. It is, in fact, to fall into a state which seems to comprehend within it all that is most gentle and soothing in idea—an epitome of pathos,—an ever-recurring text of mercy and type of tenderness,—an armistice between the contending powers of good and evil,—a relaxation of the

> "dead strife
> Of poor humanity's afflicted will,
> Struggling in vain with ruthless destiny."

In this merciful state,—perhaps a third part of an existence,—the prisoner may be for awhile set free, and the mourner no longer remember that he has cause to weep; the exile may visit the home and the pleasant fields he has left for ever; and the living may once more meet the dead, and forget that they *are* the dead. Nor let it be rashly interposed, what boots it that we have such cheering and soothing visions, if we awake and find them all shadows? For we may ask in return, would any one repel the approach of happy prosperous hours, because they must pass away, and sharpen our after-perception of crosses and sorrows which cannot be kept aloof? In one sense we may say, "is not the past all shadow?" And when we awake from the slumber of death to the realities of a future existence, this life, except for its influence on our destiny, may seem as if it had been spent in one of the many districts of dream-land.

In sickness, no language can exaggerate the blessed exchange, when the frame, racked by pain, shattered by convulsions, cramped by spasms, worn with long hours of restlessness, sometimes worse than actual pain, sinks at last into quiet slumber. So slept Beatrice Cenci:—

> "How gently slumber rests upon her face,
> Like the last thoughts of some day sweetly spent,
> Closing in night and dreams, and so prolonged.
> After such torments as she bore last night,
> How light and soft her breathing comes!
> But I must shake the heavenly dew of rest
> From this sweet folded flower."

But lastly, there are benefits over and above this healing operation of sleep. While the bodily organs are infused with new vigour, the sensibility to all delightful influences of earth and sky is redoubled; and the mental faculties, however borne down by previous toil, are again buoyant and elastic. The reason is cleared and refreshed by mere rest; and the imagination has been supplied with new materials for its operations, so that poets and romance writers have actually sought in sleep and dreams for the replenishing of their stores. But I know scarcely any intellectual advantage derived from sleep, more decided than the healthy tone which it gives to subsequent thought. It cools down the feverish imagination of the evening; sweeps away the flimsy over-subtilized webs of metaphysical speculation; subdues the morbid apprehensions of the over night; and changes the sickly sensibility to human ills,—the shrinking from humanity and its wicked-

ness and infirmities,—for an active sympathy with suffering man, a courageous desire to know the worst, and a robust resolution to encounter whatever may be painful or revolting in the paths of benevolence.

But it is superfluous to dwell upon these points, when we have a passage, from the greatest of poets, that sums up all the benign and healthful influences of sleep:—

> "Sleep, the innocent sleep,—
> Sleep that knits up the ravelled sleeve of care;
> The death of each day's life,—sore labour's bath;
> Balm of hurt minds; great nature's second course;
> Chief nourisher in life's feast."

[In the foregoing lecture magnetic sleep was barely alluded to. Had we discussed the subject at all, we must have traversed the domains of Mesmerism, Clairvoyance, Electro-Biology, Electro-Psychology, Etherio-Biology and what I dare say will some day be called Odylo-Biology! Dubious regions, dimly-lighted, phantom-peopled! where

> "Truth that is, and truth that seems,
> Blend in fantastic strife."

To weigh, and sift, and test all the statements of doctrines connected with these subjects, and to determine what should be received, and what rejected, in the marvellous stories familiar to every body through the newspapers and journals, would be a long work, for which I have little leisure, less liking, and no vocation. And I doubt if anything worthy of observation could be added to the judgment delivered some years ago by Sir John Forbes, in an admirable little work, entitled "Mesmerism True, Mesmerism False."]

II.

In our inquiry into the nature of Dreaming, the simplest, and, I think, the most philosophical course will be to ascertain, in the first instance, what the state of the mind in dreaming has in common with its waking condition, and then to proceed to consider the differences between them.

Every one, no matter how little accustomed to the analysis of his thoughts and feelings, must have noticed that a large proportion of the materials of dreams are derived from past experience; that they are the products of a kind of memory; but that they are often put together

in odd combinations, not unlike the effects of a wanton or wilful imagination during the waking hours.

To pursue the proposed order of investigation, it will be necessary, even at the risk of being somewhat tedious, or of speaking of things already sufficiently familiar to my audience, to make one or two remarks upon memory and imagination.

The simplest form of memory is the mere reproduction of a sensation, or the return of a thought, or of a former emotion to the mind. When the recurrence of certain feelings and ideas is brought about by an effort of the will, such act of the mind is denominated *recollection*. But when the past images come unbidden, we say that they are the products of mere *remembrance*. So that there are two kinds of memory, —the one *passive*, the other *active*. When the mind exists in its most listless state, past impressions and ideas, though of the faintest description, are revived in continuous succession. If the eyes are shut, and no sounds prevailing, these images may be almost unmingled with present perceptions, unless the internal organs give rise to uneasy sensations. But even when a full tide of fresh perceptions are rushing through the senses, they do not prevent the recurrence of by-gone images and emotions; on the contrary, as we shall see presently, they have a direct tendency to revive such images and emotions, and, in so doing, they often greatly enhance the pleasure or the pain of the present moment.

In active memory, we command the return of former impressions. It is true that these shadows of the past do not always come at our bidding; we may "call them from the vasty deep" of old experience, but they will not always answer. In exercising what dominion we have over them, we, however, do but subject them to the same laws as those which regulate the phenomena of passive memory,—the laws of association or suggestion. To take one of the least complex of instances. If I wish to recall the name of an absent person, I fix my mind attentively on his image; and then the place in which I last saw him, the time, the contemporary circumstances, and the conversation of other persons will also return to my mind, and very possibly bring in their train the name which was not suggested by the first presentation of his image. In a similar manner we recall a subject of discourse. In conversation we are sometimes interrupted, and, after the disturbing cause has ceased, we wish to take up the thread where it was broken off; but to find it, we may be obliged to go back to a much earlier

period in the conversation, and then the subsequent topics recur by means of those links of association which first brought them together.

It would obviously be quite out of my province to enter on the wide subject of the principles of association or suggestion; it will be sufficient to remark, that ideas, meaning by this word those states of consciousness not immediately produced by outward sensations, suggest one another, sometimes from the mere fact of their having formerly coexisted; sometimes from their similarity; sometimes from their contrast, as when the idea of a dwarf suggests that of a giant; and sometimes from proximity of place. At other times the connections are of a less casual nature. Such are the relations of analogy, of proportion, of cause and effect. I am aware that most of these principles may by a refined analysis be resolved into mere association or proximal succession. I must not omit to remark, that not only the ideas are renewed in this manner, but also the various emotions that have been formerly associated with them; and, likewise, that they are liable to be summoned before us not only by other ideas, but, likewise, by present sensations, whether derived from without, or from the internal organs. And here we must notice an interesting fact which bears importantly on the subject of this lecture, namely, that impressions may be made on the sentient nerves which, although they do not give rise to perceptions, will excite in the mind ideas and emotions either painful or pleasurable. Thus, there are various forms of indigestion, which may produce the most distressing states of mind, filling it with all kinds of gloomy ideas, and yet not give rise to sensations, in the strict sense of the word.

The operations of fancy and imagination may be analysed into ideas suggested on some one of the principles of association to which I have adverted. Fancy is generally understood as the faculty which calls up related images; though they are often connected so slightly with the first thoughts, that to many minds they never occur at all; and they are such, for the most part, as produce sentiments of the beautiful, the sublime, the ludicrous, or the terrible. Persons are said to have a quick fancy, in whom remote ideas are readily brought together. Imagination is often used synonymously with fancy; but it is a faculty of a higher description. It not only, like fancy, brings together many striking images and thoughts, and combines them in new groups which have the most agreeable or painful effect on the mind, but it so combines them as to produce images of persons and places and things, that seem to be newly created.

The products of imagination are not, like those of fancy, loosely aggregated, so that they can be seen at once to be new combinations of old materials, but they are so artificially interwoven, and all in such keeping and consistency, that they seem to be struck out at once as new individuals. Hence, the possessors of the highest form of imagination might well be called poets, literally *makers*. But even in the dullest and least poetic, these so-called faculties may be at work. There is indeed the same distinction to be drawn between active and passive fancy and imagination, as between active and passive memory. In the course of our investigation we shall find sufficient illustration of the fact to which I have last adverted.

Having made these prefatory observations, which to many present may have appeared too obvious and familiar for mention, but which I have introduced on the presumption that some of my younger hearers may not have had it in their power to pay attention even to these bare rudiments of mental philosophy, I proceed to consider what there is in common between the processes of thought in sleep, and those in our waking hours.

A very considerable majority of revived impressions consist of objects of sight, so that some have even asserted that we never dream of anything else. But this is obviously a great misapprehension; for, independently of the fact that the persons whose forms appear to the dreamer frequently seem to converse with him, it might be proved from the ideas and feelings associated with the visual reproduction that something more than the impression of sight recurs to the mind. When the friend of by-gone times revisits us in sleep, we do not recognize his form merely as one that had been seen before; but with its presence return some at least of the occurrences in his life, the points in his character, his sentiments, and familiar talk. So far is it from being true, that visual images only are produced in dreams, that it often happens that the remains of several sensations are simultaneously renewed. While our eyes seem to be feasting on the most glorious scenery of mountains, forests, rivers, and ocean, we may at the same time hear the roar of thunder, the songs of birds, the rushing of torrents, or the deep boom of the tide on the shore; we may inhale the fragrance of flowers, feel the soft breath of the sea-breeze, and hear the voice of the companion who sympathizes in our pleasure.

Still, it must be allowed that as the perceptions of the organ of sight are the most frequent and vivid of our waking sensations, so they abound most in our dreams. There is great variety in the mode

of their reproduction. They may arise as mere copies of former visions; or, to speak more correctly, the individual conceptions may appear in the same groups as when they were first presented to us; or they may be assembled so differently, as to produce the effect of entire novelty. In the first instance, the dreamer may renew his youth,—breathing once more the air of his birth-place, and once more immersed in the joys or transient sorrows of those early days; or he may re-enact the toils of his manhood; and all the stirring exertions, or the weariness and solicitude, of his daily avocations may recur in dreams, so that the days are again lived over in the nights. In the other instance, the mind may be recreated by visions of fairy scenes and unearthly forms, such as his waking eye never beheld; or it may be haunted by combinations of forms more hideous than were ever conceived even by an artist of the hag-ridden middle ages. These new assemblages of former impressions would exemplify the process of thought which we call imagination in our waking hours, only that the mind is quite passive. It does not actively and artificially work up the old materials into new forms, under the command of the will or desire, but the forms are forced upon it whether wished for or not. Many minds would be quite unable, however much they might try, to call up before their mental eyes such scenes and forms as appeared to them in sleep. But the man of genius is distinguished by his capability of effecting such combinations for a particular purpose. It is true that they are often produced in such minds with so little effort, as to arise by a sort of inspiration, or as in dreams; but they differ still from the latter in being entirely subservient to the designs of such creative power. It is an interesting fact, that the highest feats of the intellect, or, in other words, the most excellent combinations of ideas, have been such as have occurred without effort. The ingenious man, or the man of quick fancy, may put thoughts and things together, so as to produce most striking and agreeable effects; but we see that they *are* put together by a voluntary or even laborious effort, one the reverse of what ever occurs in dreaming. But in the works of genius we perceive no such marks of elaboration, unless in the finishing-off. There are no lines of junction or dove-tailing. The paradise of Milton is not such as we could conceive by assembling the different elements of all the fine landscapes and gardens which we may have surveyed; but it gives us the idea of its having been seen at once by the poet's eye just as it is described, or as our own nightly visions appear to us. The imagination

of the genius, and that of the dreamer, are thus closely allied in so far as they work by an "art unteachable, untaught;" but they differ widely in being attended and guided in the one case by the operations of the judgment, and in the other as being independent of such sway or assistance.

The remembrances which occur in dreams are often of a most interesting character, and not such as might have been expected. They bring back people of whom we have not thought for many years, —whom we have seen perhaps but once, and in the most incidental manner; and not only persons, but also places and things, and even transient thoughts; and, what is still more curious, the subjects of former dreams. I do not now dwell on these facts, because I shall have to recur to them hereafter. I may only suggest, that it is a fearful liability of our nature to have the past summoned before us, when we may have fondly hoped that it was hid for ever in deepest night,—to anticipate what is to occur in another life:

> "Each faintest trace that memory holds
> So darkly of departed years,
> In one broad glance the soul beholds,
> And all that was at once appears."

This tendency is strongly manifested in dreams. Dreams which in the morning we may fail with all our endeavours to recall, will recur many days afterwards, when their proper associations have chanced to arise; and, on the other hand, events which we had entirely forgotten may be re-enacted in sleep with all the semblance of novelty; and their source will not be recognised after awaking till other associations and remembrances have arisen. This fact will be important to remember when we have to consider the apparent fulfilment of dreams.

Reasoning operations may be conducted in sleep. Mathematicians have in their slumbers solved problems which posed them when awake. The great metaphysician, Condillac, was sometimes enabled in his sleep to bring to a satisfactory conclusion speculations which in the day were incomplete. Cabanis tells that Franklin so often formed correct and highly important conceptions of persons and political events in his sleep, that he was inclined to view his dreams with superstitious reverence; while the real fact was, says Cabanis, that the philosopher's acute and sagacious intellect was operating even in his sleep.

Thus far, then, we see that the phenomena of dreams are regulated by the same laws of association or succession as those of waking

thought; and the more closely we investigate the difference between these two classes of phenomena, the more clearly we shall perceive that many of the distinguishing characters are rather apparent than real.

Before, however, proceeding to point out in what respects the operations of the mind in sleep appear to differ from those in our waking hours, I shall adduce an example of a very interesting analysis, showing how the materials of the most heterogeneous and incongruous dreams may be traced to former and even recent experiences.

"I dreamed once," said Professor Maass, of Halle,* "that the Pope visited me. He commanded me to open my desk, and he carefully examined all the papers it contained. While he was thus employed, a very sparkling diamond fell out of his triple crown into my desk, of which, however, neither of us took any notice. As soon as the Pope had withdrawn, I retired to bed, but was soon obliged to rise on account of a thick smoke, the cause of which I had yet to learn. Upon examination, I discovered that the diamond had set fire to the papers in my desk and burnt them to ashes."

"On the preceding evening," continues Professor Maass, "I was visited by a friend, with whom I had a lively conversation upon Joseph the 2nd's suppression of monasteries and convents. With this idea, though I did not become conscious of it in my dream, was associated the visit which the Pope publicly paid the Emperor Joseph at Vienna, in consequence of the measures taken against the clergy. And with this again was combined, however faintly, the representation of the visit which had been paid me by my friend. These two events were, by the subreasoning faculty, compounded into one, according to the established rule;—that things which agree in their parts, also correspond as to the whole. Hence, the Pope's visit to the Emperor was changed into a visit which was paid to me. The subreasoning faculty then, in order to account for this extraordinary visit, fixed upon that which was the most important object in my room, viz., the desk, or, rather, the papers it contained. That a diamond fell out of the triple crown was a collateral association, which was owing merely to the representation of the desk. Some days before, when opening the desk, I had broken the glass of my watch which I held in my hand, and the fragments fell among the papers; hence no further attention was paid to the diamond, as it was a representation of a collateral series of things.

* Quoted in Mr. Dendy's Philosophy of Mystery.

But afterwards, the representation of the sparkling stone was again excited, and became the prevailing idea; hence it determined the succeeding associations. On account of its similarity, it excited the representation of fire, with which it was confounded; hence arose fire and smoke. But in the event the writings only were burnt, not the desk itself; to which, being of comparatively less value, the attention was not at all directed."

The most obvious *difference* between the sleeping and waking state has reference to the comparative vividness of present and past sensations; for while in the latter state ideas of sensational impressions are so faint as to be readily distinguished from things actually present (except in certain morbid conditions), in the former the reverse of this happens; perceptions fade away and former sensations are revived with an intensity that gives them the character of reality. That the intensity or vividness is not altogether dependent on the want of contrast with perceptions, I consider inferrible from the fact that actual outward sensations are often mingled with those which are revived. Slight sounds, feelings of heat and cold, frequently enter into the composition of our dreams, and by the laws of association suggest new scenes and characters in those nightly dramas. Exposure of the skin to the cold may suggest all the scenery of Greenland, or the adventures of a Polar expedition. The faint light which penetrates the closed eyelid may give the idea of a conflagration, and so on. From this difference of degree, whether absolute or relative, in the vividness of ideas, it happens that the remembrances which occur in dreams are *not felt* to be remembrances. Whatever is then presented to the mind is not subjective but objective. Let it be a scene or transaction, it does not appear to us as a vision, but we take a part in it, and are involved mysteriously in its interests. Hence often the strangeness and incoherence of dreams. Our personal identity remains, and yet we are engaged in transactions that happened centuries ago. On this subject I may quote the experience of the English Opium Eater, related in his own peculiarly eloquent language. "I had been, in youth, and even since, for occasional amusement, a great reader of Livy, whom, I confess, that I prefer, both for style and matter, to any other of the Roman Historians; and I had often felt, as most solemn and appalling sounds, and most emphatically representative of the Roman people, the two words so often recurring in Livy, '*Consul Romanus*,' especially when the Consul is introduced in his military character. I mean to

say that the words *king*, *sultan*, or *regent*, or any other titles of those who embody in their own persons the collective majesty of a great people, had less power over my reverential feelings. I had, also, though no great reader of history, made myself minutely and critically familiar with one period of English History, viz., the period of the Parliamentary War, having been attracted by the moral grandeur of some who figured in that day, and by the many interesting memoirs which survived those unquiet times. Both these parts of my lighter reading having furnished me with matter of reflection, now furnished me with matter for my dreams. Often I used to see, after painting upon the blank darkness a sort of rehearsal whilst waking, a crowd of ladies, and perhaps a festival, and dances. And I heard it said, or I said to myself, 'These are English ladies from the unhappy times of Charles I. These are the wives and the daughters of those who met in peace, and sat at the same tables, and were allied by marriage or blood; and yet, after a certain day in August, 1642, never smiled upon each other again, nor met, but in the field of battle, and at Marston Moor, at Newbury, or at Naseby, cut asunder all ties of love by the cruel sabre, and washed away in blood the memory of ancient friendship.' The ladies danced, and looked as lovely as the court of George IV. Yet I knew even in my dream that they had been in the grave for nearly two centuries. This pageant would suddenly dissolve, and at a clapping of hands would be heard the heart-quaking sound of *Consul Romanus;* and immediately came sweeping by, in gorgeous paludaments, Paulus or Marius, girt round by a company of centurions, with the crimson tunic hoisted on a spear, and followed by the alalagmos of the Roman legions."

Before leaving the consideration of revived sensations, I may notice a peculiarity as to light and sound. We seldom, at least in healthy dreams, have visions of great brilliancy; the light is not that of the noon-day, but the sober hue of evening, or even the dim grey shade of twilight. Hence, when we speak of shadowy, ill-defined perceptions of our waking life, we are apt to call them dream-like. The same obtains of sounds, which, unless produced by outward causes, and blended with the dream, are usually of the kind described by the poet,

"Like the faint, exquisite music of a dream."

The imperfection of the dreaming memory is remarkably illustrated when we are revisited by the forms of those who have long departed

this life; for we believe them to be still living, simply because we have forgotten that they are dead. Another very important fact as to these revived impressions is, that we do not often subject them to the dominion of the will. A great difference is very observable in those processes of thought which belong to the imaginative faculty. The combinations are not, as under the active imagination of our waking hours, effected in order to fulfil some illustrative purpose, nor, as in the passive imagination, are we conscious that the scenes, however wild, and the persons, however monstrous, are mere creations of the mind. The emotions they excite are often of the most overpowering description.

> "Dreams in their development have breath,
> And tears, and tortures, and the touch of joy.
> They leave a weight upon our waking thoughts,
> They take a weight from off our waking toils,
> They do divide our being. * * *
> * * * * They have power,
> The tyranny of pleasure and of pain."

But, on the other hand, it is a singular distinctive characteristic of dreaming that the emotions which we might, *a priori*, have expected to arise are not produced. Of these the emotion of surprize or wonder is the most frequently wanting. The wildest incoherences, the confounding of personal identities, the mingling of material and mental properties, the most miraculous violations of the best ascertained laws of nature, excite no more amazement than the commonest events of life. I have dreamed of standing at the foot of a vast cataract, picking up shells and sand, the fall of water being suspended, as it were, in the air, while I was quietly employed at its base, and unconscious that there was anything extraordinary in all this. Dr. Macnish says, "on one occasion fancy so far travelled into the regions of absurdity, that I conceived myself riding upon my own back; one of the resemblances being mounted upon another, and both animated with the soul appertaining to myself, in such a manner that I knew not whether I was the *carrier* or the *carried*."

A gentleman to whom this Institution is largely indebted gave me the following experience:—"I have several times appeared to read a portion of an imaginary work as *regularly* as if it had been real. I have also dreamed that I was dead, and that I carried my own body in a coach to bury it, and that when I reached the place of burial a stranger said, 'I would not advise you, sir, to bury your body in this

place, for they are about to build so near it, that I have no doubt the body will be disturbed by the builders.' 'That,' I replied, 'is very true! I thank you for the information, and I will remove it to another spot;' upon which I awoke."

It is probable that the absence of surprize, on the occasions alluded to, is due to the defective exercise of the comparing faculty. A want of discernment of the true relations of things is one of the most remarkable characteristics of dreaming, and consequently the newness and strangeness of the connections of the things presented to our observation do not strike us. Defective exercise of the comparing faculty, however, is a roundabout phrase for expressing the fact, that the associated ideas are fewer in number. Dryden says:—

> "Dreams are the interludes which fancy makes;
> When monarch reason sleeps, this mimic wakes,
> Compounds a medley of disjointed things,—
> A court of coblers, or a mob of kings."

Now, "a mob of kings" to a person awake would be odd and surprizing enough, because with such a sight there would arise in his mind all his former ideas of those august personages. But the dreamer has the regal multitude before him, and no other idea arises in his mind, by memory or association, to shew the absurdity of the impression. The blending of the past and present, the intermingling of the events of the 17th and 19th centuries, the division of the indivisible personal consciousness, from the want of due associations, are not perceived to be incongruities, or impossibilities, and therefore we are not surprised. It is in this respect that dreaming bears so close a resemblance to insanity, so that it has been long ago remarked that delirium is dreaming awake, as dreaming is the delirium of sleep. A notable difference, however, consists in this, that the former is apt to be acted upon, while the execution of the sleeper's vagrant fancies is precluded by the thraldom in which his active powers are held; except in those morbid cases in which the nervo-muscular system does not slumber with the rest of the body, and to which I alluded in my former lecture.

Some metaphysicians of high reputation have held, that the want of command over the order of our ideas is the great distinguishing mark of dreaming,—an opinion to which we cannot entirely subscribe. The suspension of volition, though a frequent, and, perhaps, a general accompaniment, is not by any means indispensable to dreaming; for

we certainly do exercise it in the recollections, and in the efforts at action in our dreams. Nevertheless, as we have already observed, the principal mental phenomena are of the passive character. It must be borne in mind, however, that in sleep we do not often *wish* to command our thoughts. When we are awake, our sensations are constantly interfering with the order of ideas, and, therefore, we are obliged to exert efforts of the will, as it is called, to keep such and such thoughts before us. Ideas are more readily associated with ideas, when sensations are excluded. Hence many persons instinctively close their eyes when engaged in deep thought. And the vagrant ideas of a person in a reverie, or fit of abstraction, or in a brown-study, being little mingled with perceptions, are very like those of a dreamer.

The *partial* character of the thinking and feeling processes in sleep, is well illustrated by the defect of that form of judgment which constitutes *taste*. The most miserable doggerel may then pass before the mind as exquisite poetry. Orations may seem to be uttered worthy of the lips of Demosthenes, and arguments may be maintained which seem as irrefragable as the demonstrations of Euclid; and yet, were these reasonings and declamations uttered by a waking person, they would sound little better than the incoherent ravings of a maniac. Yet even to this general rule there have been remarkable exceptions. Cases are on record of judges who, in their sleep, have delivered decisions of the weightiest kind; and of poets who, in that state, have composed verses of great power and beauty, though they were by no means exempt from a certain degree of mystical indistinctness. The most striking instance is Mr. Coleridge's poem, entitled "Kubla Khan," which he himself characterised as a "psychological curiosity."

Another instance of the difference between dreaming and waking thought is that curious suspension of the moral sense, which is sometimes experienced. To this slumber of the conscience the virtuous are not less prone than the wicked. It is by no means true, as it has often been asserted, that the natural character is necessarily repeated in the state of dreaming. Frequently it is so; the brave enact prodigies of valour; the cowards die many deaths in their sleep; the compassionate are dissolved in grief for the woes of imaginary sufferers, and so on. But occasionally the reverse of this happens, just as in the analogous state of insanity. The pacific become pugnacious; the gentle and open-hearted entertain strange suspicions and animosities; and the pure give utterance to sentiments which shock us like the snatches of

old songs that fall from the innocent lips of Ophelia. So in sleep, deeds from which we should shrink with horror when awake, are performed not only without the least remorse, but even without any question in our minds as to their propriety.

The seemingly extraordinary lapse of *time* has been often remarked in sleep, and it is easily explained. We can think of the events which compose the dream, in the same time as we dreamed them; but in the dream, these events, though only thought of, seem to be real, and seeming real, they leave the same impression of time on the mind as if they had actually happened. The feeling of time arises from the number of perceptions. The greater their number, and the more vivid and varied they are, the longer will seem to have been the time they occupied. It is just the reverse with thoughts. The more intense the latter, the less is the feeling of time. But in dreaming, what are really thoughts impress us with the belief that they are outward perceptions, and, as such, they excite a corresponding idea of time; so that

> "a thought,—
> A slumbering thought is capable of years,
> And curdles a long life into one hour."

The sense of *space* is sometimes wonderfully affected. Mr. De Quincy says, "buildings and landscapes were exhibited in proportions so vast, as the bodily eye is not fitted to receive. Space swelled and was amplified to an extent of unutterable infinity. This, however, did not disturb me so much as the vast expanse of time. I sometimes seemed to have lived 70 or 100 years in one night,—nay, sometimes had feelings representative of a millenium passed in that time, or a duration far beyond the limits of human experience."

On reviewing then the state of the mind in the sleeping man as compared with its condition in one awake, it does not appear that there is any one of the faculties, as some would say, or any of the states of consciousness, as others would express it, which may not be exercised or exist in dreams. The sleeper may, though he does not ordinarily do so, see, hear, smell, taste and touch; he may, and commonly does, remember and imagine; he may reason, and reason rightly according to his premises; he may be agitated by the same passions, and be subject to the same refined sentiments of the moral, the sublime, and the beautiful, as when he is awake. Wherein, then, consists the difference? Mainly in this,—that the mental processes are far less

complete. Though specimens of any one of the classes of thoughts and feelings may be presented, the number and variety are very inferior to those of the waking state. Sensations occur so seldom as to be exceptional. The mind does not pass, so to speak, from perceptions to remembrances, and then back again to perceptions; and the associated ideas are so sparing as to produce those defects of judgment which we have just noticed. The stores given up by memory, though often surprising in their variety and far-fetched character, are still very scanty,—as, for instance, when we remember and seem to behold the friend who died in our childhood, and *yet forget* that he is no more; and the products of our imagination are not corrected by the judgment, because only a few associations arise in our minds. Though the moral sense is alert and even morbidly so at one time, at another it is quite paralysed. In short, I need not repeat, what I hope has been already sufficiently illustrated, that the great distinction between the two conditions is one of *degree* rather than of *kind*. There is, however, one difference apparently of kind, namely, that which I have noticed as the actual or seeming intensity of revived sensations, and which, when occurring in our waking hours, produces the phenomena of spectral illusions. But even this difference is resolvable into one of degree. To sum up then: the materials of dreams are the same as those which belong to our waking life, though they are fewer in number, and occur in different degrees of intensity; and the laws which regulate their order and composition are the same as those which operate in the other great division of our existence.

Having thus endeavoured to point out the leading features in which the phenomena of dreams resemble or differ from those of our waking thoughts and feelings, I proceed to inquire which of our past sensations are more likely to be renewed in the mental processes of sleep. And I may state in the onset, that much will depend in this respect on the character of sleep, as to its being healthy or unhealthy. In the former condition, I believe it will be found consistent with general observation, to say that the ideas (using this term as before to express the images of former perceptions) most apt to arise are those which have been prompted by the events and the thoughts of the previous or recent days. I say *prompted* by the latter, for I do not consider it a character of healthy sleep to have the occurrences of the day renewed in it. The more strictly we analyse our dreams, the more perhaps we shall be struck by their connections with recent experience; and yet the entirely

different and remote matter which constitutes the body of the dream is not less remarkable. By the operation of the laws of association, persons and things long by-gone and forgotten are recalled in such vivid colours, and they occupy so prominent a place in the vision, that the circumstances which suggested their recurrence are apt to be totally overlooked. This fact, though not much noticed by those who have investigated our subject, seems to me particularly interesting, because it affords a striking indication of the harmonious arrangement of the human economy. The mind is refreshed and invigorated by the presentation of images which have not recently occupied its attention, whether they occur in the form of simple revived perceptions, or are wrought up by imagination into combinations that have all the effect of novelty. And again, the faculties of passive memory and imagination which are thus employed, are precisely those which have been least exercised in the waking hours of the busy-minded man; while those which he most employs in the occupations of the day, namely, perception, active memory, and judgment, are enjoying complete repose. Whether listless day-dreamers are refreshed in the night season is a matter of little moment. I think it probable, that the machinery by which this beneficent contrivance is executed, is of the same nature as that which I endeavoured to point out on a former occasion, when treating of the efficient or physical cause of sleep. It is a general law, that the vital processes of nutrition and secretion are not equally active in all parts of the system at the same time, and that activity in one part is compensated by an opposite state in another part. When those portions of the brain which belong to the faculties of active observation and reflection have ceased to act, those in which memory and imagination reside, may be brought into play with but little demand on the strength of the system. This latter view is, however, hypothetical, and whether true or not, does not interfere with the importance or interesting nature of the fact which it seeks to explain.

Of the refreshment afforded by the arrangement which I have hinted at, we obtain perhaps a most decisive converse evidence from that kind of sleep which is not healthy; and which, like all morbid states, is a deviation from the natural condition. How little repose is experienced on awaking from a sleep in which we have done little else than go over afresh the cares, the wearisome duties, the perturbations and struggles of the previous day; a kind of sleep which is well known by those who go to bed over-tired, over-excited, too weary to

sleep, or, when sleeping, dreaming of labour.* One form of this over-fatigue is well known by literary men who retire to rest with their minds surcharged with the subject of some particular composition. Our illustrious townsman, Southey, gave an excellent admonition to a friend of mine who was writing a poem,—"Be sure when you dream of your subject, to lay your work aside for a few days." This advice was founded on his own experience. When that against which he warned my friend happened to himself, he made it a rule to engage in some other research. The secret of this is, the unnatural excitement of a part of the nervous system, so that its action continues when it ought to subside. Everybody must have felt the difficulty of getting rid of an impression on going to sleep, which, either from the vividness of its first presentation, or from the anxious emotions related with it, or simply from its long entertainment by the mind, continues in spite of our will. Such impressions bear a close analogy to those which are sometimes left on the mere organs of sense. When the eye has become fixed on a luminous object, the image remains for a time on the retina, even after the eyelids are closed. Loud and long continued sounds continue to echo in the ear, such as the roll of a carriage, &c. Analogous to these also is that feeling of oscillatory movement which is left in the body after tossing on the sea.

Continuance then of the day's impressions and thoughts may be considered as one of the forms of unhealthy dreaming. Another kind is that which derives its materials from bodily disturbances. These usually suggest emotions of gloom, fear, vexation, as well as scenes associated with such feelings, and derived from memory and imagination. Pressure upon some of the nerves of the skin in an uneasy posture, exposure of a part of the surface to cold, and indigestion, with its myriad morbid impressions, will give rise to the most frightful fancies. One hand cold and benumbed applied to the other, has suggested the idea of a visitant from the grave laying its deathy grasp on the sleeper in token of the truth of a communication which was the product of his own brain. As to the impressions derived from disorder

* "Atque in quâ ratione fuit contenta magis mens
In somnis eadem plerumque videmur obire:
Causidici causas agere, et componere leges;
Induperatores pugnare, ac prælia obire;
Nautæ contractum cum ventis cernere bellum;
Nos agere hoc autem, et naturam quærere rerum
Semper, et inventum patriis exponere chartis."
Lucret. Lib. IV.

of the internal organs, it must not be supposed that the painful and disagreeable dreams have not had such an origin, merely because the individual is unconscious of any such derangement; for, as we have already remarked, the sympathetic sensation often supersedes the primary impression. In the waking state, our minds may in like manner be oppressed by gloom and despondency, or filled with apprehensions of coming calamities, and the whole world "sicklied o'er" with the cast of dismal thought, though nothing has occurred at all warranting such feelings, and we ourselves are unconscious of anything wrong in the bodily organs. Yet, that these were in fault is proved by the dissipation of the unhealthy fears and anxieties under the influence of measures which correct the corporeal functions.

Sometimes by the pressure of direct sensations from without, provided they are not too strong to arouse the sleeper, his dreams assume a happy character. Such may be the effect of faint and distant music, recalling delightful hours from the past, or suggesting imagery and actors from the world of poetry and romance.

It is a curious fact, that sometimes external impressions which have only been made during sleep, have also been revived in that state exclusively.* On the other hand, what has been heard in a half-dreaming state, may recur in a dream, and be afterwards remembered without the original source having been recognised. This may afford a clue to some mysterious verifications of dreams.

Of the material causes of dreams, none are more remarkable than the substances called narcotics, especially opium and belladonna. These drugs, while they annul the susceptibility of the sensory ganglia to outward impressions, have often a singularly exciting and perturbing influence on those portions of the brain which, at our last meeting, we pointed out as belonging to intellectual processes, and to the higher sentiments.

Nowhere are the effects of opium described with more power and eloquence than in the "Confessions of an English Opium Eater;" and I therefore shall not apologize for reading you more than one extract from that singularly interesting work.

"Oh! just, subtle, and mighty opium! that to the hearts of poor and rich alike, for the wounds that never heal, and for the 'pangs that tempt the spirit to rebel,' bringest an assuaging balm; eloquent

* An interesting case of this kind is related by Dr. Abercrombie in his work on the Intellectual Powers.

opium! that with thy potent rhetoric stealest away the purposes of wrath; and to the guilty man, for one night, givest back the hopes of his youth, and hands washed pure from blood; and to the proud man a brief oblivion for 'wrongs unredressed, and insults unrevenged;' that summonest to the chancery of dreams, for the triumph of suffering innocence, false witnesses, and confoundest perjury, and dost reverse the sentences of unrighteous judges;—thou buildest upon the bosom of darkness, out of the fantastic imagery of the brain, cities and temples beyond the art of Phidias or Praxiteles,—beyond the splendour of Babylon and Hecatompylos; and 'from the anarchy of dreaming sleep' callest into sunny light the faces of long buried beauties, and the blessed household countenances, cleansed from the 'dishonour of the grave.' Thou only givest these gifts to man; and thou hast the keys of paradise, Oh! just, subtle, and mighty opium!"

The following extract illustrates the more distressing dreams produced by opium.

"The waters now changed their character; from translucent lakes, shining like mirrors, they now became seas and oceans. And now came a tremendous change, which unfolding itself slowly, like a scroll, for many months, promised an abiding torment, and, in fact, it never left me until the winding up of my case. Hitherto the human face had mixed often in my dreams, but not despotically, nor with any special power of tormenting. But now that which I have called the tyranny of the human face began to appear; the sea appeared paved with innumerable faces, upturned to the heavens; faces imploring, wrathful, despairing, surged upwards by thousands, by myriads, by generations, by centuries; my agitation was infinite, my mind tossed and surged with the ocean."

I cannot resist the temptation of offering one more quotation, wonderfully interesting in what it describes, and still more so in the eloquence of the description.

"The dream commenced with a music, which now I often hear in dreams,—a music of preparation, and of awakening suspense,—a music like the opening of the coronation anthem, and which, like *that*, gave the feeling of a vast march, of infinite cavalcades filing off, and the tread of innumerable armies. The morning was come of a mighty day,—a day of crisis and of final hope for human nature, then suffering some mysterious eclipse, and labouring in some dread extremity. Somewhere, I knew not where,—somehow, I knew not how,—by some

beings, I knew not whom,—a battle, a strife, an agony was conducting, was evolving, like a great drama or piece of music, with which my sympathy was the more insupportable, from my confusion as to its place, its cause, its nature, and its possible issue. I, as is usual in dreams (where of necessity we make ourselves central to every movement), had the power, and yet had not the power to decide it. I had the power, if I could raise myself to will it, and yet, again, had not the power; for the weight of twenty Atlantics was upon me, or the oppression of inexpiable guilt. 'Deeper than ever plummet sounded' I lay inactive. Then, like a chorus, the passion deepened. Some greater interest was at stake, some mightier cause than ever yet the sword had pleaded, or trumpet had proclaimed. Then came sudden alarms, hurrying to and fro, trepidations of innumerable fugitives, I knew not whether from the good cause, or the bad, darkness and lights, tempests and human faces, and, at the last, with the sense that all was lost, female forms, and the features that were worth all the world to me, and but a moment allowed; and clasped hands, and heart-breaking partings, and then everlasting farewells! And with a sigh such as the caves of hell sighed when the incestuous mother uttered the abhorred name of death, the sound was reverberated,—everlasting farewells! and again, and yet again reverberated,—everlasting farewells!—I awoke in struggles, and cried aloud, 'I will sleep no more.'"

I must now devote some remarks to the question of the prophetic character of dreams. And first we must endeavour to state the question clearly. It is not whether dreams are ever fulfilled, whether the subsequent facts correspond to those prefigured in the dream, but whether the correspondence is such that we are obliged to infer that the future was revealed to the dreamer by the interposition of superhuman power?

Before receiving evidence as to events that do not lie within the limits of ordinary experience, we naturally and instinctively consider their antecedent probability. It may be that, however extraordinary the occurrence, still it has no improbability. The mind may have been prepared for it, as in the case of the magnetic spark; wonderful as was the discovery, it harmonized with previous knowledge upon the subject. On the other hand it may not only be extraordinary, but it may be also opposed to all *a priori* views. In the former case a much smaller amount of evidence will be sufficient for inducing us to admit

the fact. In the latter we require the most rigid proof that testimony is capable of affording.

As to the present question, it might appear to some that improbability cannot be predicated of such events, seeing that so many instances are vouched for in Holy Writ, and that if it has already pleased God to make communications to his creatures through dreams and visions, it is presumptuous to deny the probability of His doing so again. But upon a further consideration, we must, I think, perceive that these very cases do really render more improbable the repetition of such interferences in ordinary life, inasmuch as they belong to a dispensation altogether miraculous and supernatural.

Now, the very nature of dreaming, according to what has been already advanced this evening, and, indeed, according to every one's nightly experience, is such as to negative the probability of dreams being made the medium of such communications as are assumed. We have seen that they are full of the most glaring incongruities, and that there is the closest resemblance between the mental condition of the dreamer and that of the lunatic; and unless, as in uncivilized communities, we are disposed to invest the latter with a sacred character, we can hardly be willing to look upon the former as a gifted personage, because he *is* a dreamer. If we are not justified in looking, in our waking hours, for communications that may supersede the results of those faculties which the Creator has given us for our guidance, *a fortiori*, we cannot expect them, when, from the imperfect state of the mind, we should be unable to distinguish the suggestions of our errant unbridled fancy from divine inspirations.*

It is a favourite and good argument much in use with Englishmen, that whatever leads to bad *practical* results must be unsound in *theory*. Now, it would be easy to shew that very evil consequences would result and have resulted from faith in dreams. The lives of some may be wasted in vague expectations of happiness, foretold in dreams, while visionary clouds and darkness may perpetually overshadow the days of others, who else might have gone on their way rejoicing.

But these objections to the prophetic nature of dreams are only of an *a priori* formation. It may yet be a matter of fact that dreamers have been the subjects of supernatural illumination. But to admit the fact, as I have said, we require the strongest evidence.

* A line of argument somewhat similar to this may be found in Cicero's treatise "De Divinatione."

1stly. We must remember that the testimony is single, and, so far, less to be trusted than were it confirmed by the experience of others. A dream, in its nature, is cognizable only by one mind. We depend, then, on the veracity of a single informant, except in those cases in which the dream has been related before the event which fulfilled its augury.

2ndly. If the dream comes to us second-hand, we must remember that the love of the marvellous, so inherent in man, renders the hearer as prone to believe, as the narrator to dress up a wonderful story. The relaters of the most real events are but too prone to modify and add to their stories, or to suppress circumstances, in order to make them fit some particular view. The account of a civil commotion witnessed by two persons of different political sentiments, will differ most remarkably. Each unconsciously moulds the facts so as to adapt them to some pre-existent view. This is signally the case with the relaters of dreams, whom it is impossible to gainsay, however much we may disbelieve them.

3rdly. We must reject all cases in which the verification of the dream may be explained on other principles than that of a real prophetic power. Of these principles, the first that occurs to our notice is casual or fortuitous fulfilment. The sense I here attach to *fortuitous* is this. The event in the dream, and its subsequent corresponding event, happen near together, but are dependent on different trains of causes. To take a familiar instance of another kind. A person from Cumberland, and another from Cornwall, formerly fellow-students, having lost sight of each other for many years, meet some fine May morning quite unexpectedly in Pall Mall or Cheapside, and, on comparing notes, they find that they had arrived in town on the same day, and had left home on the same day. They part and never meet again; and nothing comes of the interview but a story to tell over and over again, as they advance in life, of the singular coincidence that happened among other wonderful occurrences in their visit to London. Now, if the interview had produced any important influence on the life of either party, it would have been difficult to resist the temptation of viewing it as an event specially brought about by a higher power for the particular result in question. And yet many other events just as important in their results, though not occurring in the same unusual manner, have as good a title to be viewed as instances of direct interposition. To

the religious mind which believes that all things are of God, that "in Him" we "constantly live and move, and have our being," that "not a sparrow falls to the ground without his permission," every event must be held as subject to his ordinance; and it will not be hastily presumed, that those are specially so which affect one person in particular. For who can affect to say what events are momentous or otherwise? That meeting of two friends in London, though it seemed not "to point a moral," however much it might "adorn a tale," may have been very important to others. The narrative reaching the ears of a solitary recluse, whose heart had been long, long yearning for the friend of his youth, may have prompted him to undertake a journey to London in the hope of some similar happy coincidence; and he may have lost his life on his journey, or, having got safe to the end of it, may have failed in his hope, and yet been led to form an acquaintance, or even tenderer connections, that altered the complexion of the remainder of his existence, or even wonderfully affected remote posterity; so infinite, and infinitely connected, are the links in nature's chain of existences. The principle of mere coincidence, then, will explain many fulfilments of dreams as they are called; and it must not be presumed that it is not mere coincidence, because the dreams are of an unusually interesting character. When one thinks of the vast number of dreams which happen to every one in proportion to the number that come true, I only wonder the fulfilments are so rare. I have dreamed as much as most people in my time, but I never yet experienced any of these remarkable verifications. I have conversed with numbers of dreamers, and though they abounded in interesting recitals of what had happened to their friends in this way, I have seldom, very seldom, found one who had been himself gifted with prophetic visions; just as for a thousand ghost-story-*tellers*, we meet with scarcely one veritable ghost-*seer*; and he turns out to be the subject of a peculiar nervous disorder, that destroys the balance between the perceptive and conceptive faculties.

As an instance of what strange things may happen in the way of coincidence, I shall relate an anecdote of two persons who dreamed the same dream.

"A young man, who was at an academy a hundred miles from home, dreamt that he went to his father's house in the night, tried the front door, but found it locked, got in by a back door, and, finding

nobody out of bed, went directly to the bed-room of his parents. He then said to his mother, whom he found awake, 'Mother, I am going a long journey, and I am come to bid you good-bye;' on this she answered, under much agitation, 'Oh! dear son, thou art dead.' He instantly awoke and thought no more of his dream, until a few days after he received a letter from his father, enquiring very anxiously after his health, in consequence of a frightful dream his mother had on the same night in which the dream now mentioned occurred to him. She dreamt that she heard some one attempt to open the front door, then go to the back door, and, at last, come into her bed-room. She then saw it was her son, who came to the side of her bed, and said, 'Mother, I am going a long journey, and am come to bid you good-bye;' on which she exclaimed, 'Oh! dear son, thou art dead!' But nothing unusual happened to any of the parties. This singular dream must have originated in some strong mental impression which had been made on both the individuals about the same time; and to have traced the source of it would have been a subject of great interest."*

In other dreams the communications made, though at first astounding, and all but supernatural, are easily referable to a principle which I noticed in the earlier part of this lecture, I mean the revival of impressions which had remained dormant and unremembered for an indefinite period, till some particular incident occurred capable of giving the magic touch of re-vivification, like the marvellous words, "Open, Sesame!" the only ones that would unlock the treasury of past perceptions. If a person may grow up to adult age, and never remember a scene which happened in earliest childhood, till the suggestive association has been afforded by the smell of a certain flower of rare occurrence, it is quite conceivable that in the mental processes of sleep some phenomenon may occur that has this effect on what had previously been forgotten, and which may seem to be a new representation. One of the most striking instances of a person's remembering in a dream what he had forgotten in his waking state, may be found in the case of Mr. R., narrated by Sir Walter Scott, in his Notes to "The Antiquary."

Some dreams work their own fulfilment. The mind vehemently possessed by an idea thus received, almost instinctively acts up to it. An unhappy person having dreamed that he should commit murder,

* Dr. Abercrombie.

was continually haunted by the impression, so that at last he fell upon the crime as if devoted to it by an irresistible destiny. The influence of an idea of the same kind, but obtained from another source, is but too often exemplified. The details of atrocities in our public prints so fasten on the minds of persons of a certain temperament, as to lead, on the principle of passive imitation, to the perpetration of like horrible deeds. Suicide has often been so induced. A belief in the premonitions of dreams would greatly add to the effect. The subject of it might fancy himself, Orestes-like, doomed to be, in the hands of Fate, the instrument of punishment to the appointed victim, and yet be himself the more pitiable of the two. But the dream may sometimes act by supplying an additional motive to those already in operation, strengthening the sense of duty, or some passionate enthusiasm. Thought of at first as a bare possibility, amusing the mind that contemplates it, it becomes familiar. Circumstances happen that bring it nearer to a probability, and at last the dreamer's own will converts it into a certainty. Oliver Cromwell is said to have had a remarkable dream when a boy. "He had laid himself down one day," it is said, "too fatigued with his youthful sports to hope for sleep, when suddenly the curtains of the bed were slowly withdrawn by a gigantic figure, which bore the aspect of a woman, and which, gazing at him silently for awhile, told him that he should, before his death, be the greatest man in England. He remembered, when he told the story, that the figure had not made mention of the word *King*."* Forty years of the life of this wonderful man passed without any occurrence that we can imagine likely to have reminded him of this incident as anything but a dream. By and by, in his fierce struggles with the regal power, the phantom might have passed before his mind, and still, perhaps, only raised a smile on the patriot's stern countenance. At Naseby the phantom might have worn a solemn aspect,—and at Worcester it might have grown into a spirit, and the voice into an oracle. Perhaps, on the floor of the House of Commons, when, by the breath of his mouth, he drove the Long Parliament from the very scene of his anti-monarchial exertions, his soul at last became fully obedient to the spell of the idea, which had now reached its full development. His strong will, then become dominant over every other, may have become the servant of his thought. He had realized his dream. Cromwell,

* Foster's Cromwell, in the Lives of British Statesmen.

though not a king, had made himself, in very deed, the greatest man in England.

In other cases the dream is fulfilled on a different principle. We have seen that the operations of the mind may, in sleep, closely resemble those of our waking hours, especially when the sleeper retires with his mind full of a particular subject. The thoughts of the day are not only repeated in this morbid sleep, but even extended, so that new and important results may be obtained. But the suggestions of the mind so formed may, because they have occurred in a dream, be erroneously taken for supernatural communications. The following case, related by Dr. Abercrombie, well illustrates what I have said. "A most respectable clergyman, in a country parish of Scotland, made a collection at his church for an object of public benevolence, in which he felt deeply interested. The amount of the collection, which was received in ladles carried through the church, fell greatly short of his expectation; and during the evening of the day he frequently alluded to this with expressions of much disappointment. In the following night he dreamt that three one-pound notes had been left in one of the ladles, having been so compressed by the money which had been thrown in above them, that they had stuck in the corner when the ladle was emptied. He was so impressed by the vision, that at an early hour in the morning he went to the church, found the ladle which he had seen in his dream, and drew from one of the corners of it three one-pound notes."

But it is very needful to be cautious as to such presumptions from apparent final causes. For proof of which we may turn to the autobiography of Capt. John Crichton, a gentleman who served in Scotland during the unhappy reigns of Charles II. and James II. This worthy relates how, on two separate occasions, his dreams indicated the clue to the hiding-place of some of the unhappy Covenanters, who in those days were undergoing a brutal persecution, days when the principles of toleration and christian charity were but little acted upon by either of the conflicting parties in the ascendancy. By the information received in his dreams, Capt. Crichton was enabled, on both occasions, to pounce upon his victims. "Having drank hard one night," he says, "I dreamed that I had found Capt. David Steele, a notorious rebel, in one of the five farmers' houses, in the shire of Clydesdale, and parish of Lismahego, within eight miles of Hamilton, a place that I

was well acquainted with;" and then he tells how by means of this information he caused the man's death!

In this and similar cases the mind of the dreamer is placed passively in the very situation which we endeavour, but often in vain, to assume in our attempts at active recollection. All these associated circumstances are called up which may escape our ordinary memory. It is highly probable that the Captain's observant eye had transiently noticed the spots alluded to as probable lurking-places of the fugitive Covenanters. In the subsequent hurry of action they were forgotten, but they were afterwards reproduced in his dream.

But my hearers may, perhaps, be weary of my attempt to disenchant dreams of their mysterious interest. They may be inclined to ask how I deal with those cases in which an event was vividly and minutely pre-figured to a person hundreds of miles from the spot where it was really occurring, or at a considerable period before it came to pass; such, for instance, as the following, narrated in an old work, "The Itinerary of Mr. Fiennes Morrison."

"Whilst I lived at Prague, and one night had sat up very late drinking at a feast, early in the morning, the sunbeams glancing on my face as I lay in my bed, I dreamed that a shadow passing by told me that my father was dead, at which, awaking all in a sweat, and affected with this dream, I rose, and wrote the day and hour, and all circumstances thereof, in a paper-book, which book, with many other things, I put into a barrel, and sent it from Prague to Strode, thence to be conveyed into England. And now being at Nuremberg, a merchant of a noble family well acquainted with me and my friends arrived there, who told me my father died some two months ago. I list not to write any lies; but that which I write is as true as strange. When I returned into England some four months after, I would not open the barrel I sent from Prague, nor look into the paper-book in which I had written this dream, till I had called my sisters and some friends to be witnesses, when myself and they were astonished to see my written dream answer the very day of my father's death.

"I may lawfully swear that which my kinsman hath heard witnessed by my brother Henry whilst he lived, that in my youth at Cambridge I had the like dream of my mother's death, when, my brother Henry living with me, early in the morning I dreamed that my mother passed by with a sad countenance, and told me that she could

not come to my commencement, I being within five months to proceed Master of Arts, and she having promised at that time to come to Cambridge; and when I related this dream to my brother, both of us awaking together in a sweat, he protested to me that he had dreamed the very same; and when we had not the least knowledge of our mother's sickness, neither, in our youthful affections, were any whit affected with the strangeness of this dream; yet the next carrier brought us word of our mother's death."

Supposing these narratives to be true, and regarding them for the moment as instances of a kind of revelation, we look for a final cause, but we discern none, unless it be the possibility of some influence on the spiritual condition of the individuals.

A similar difficulty presents itself, when we read of the warnings made through ghosts and dreams of the death of the celebrated or notorious Duke of Buckingham. In fact, as Captain Grose says, "in cases of murder, a ghost, instead of going to the next justice of the peace and laying its information, or to the nearest relation of the person murdered, appears to some poor labourer who knows none of the parties, draws the curtain of some decrepit nurse or almswoman, or hovers about the place where the body is deposited."

Before any such cases are received as true occurrences, it behoves us to apply most rigorously all the tests of evidence; and I hope I shall not be deemed unduly suspicious, if I say that in very few instances can we be satisfied that the relater of the dream, even when wishing to be strictly accurate, has not been deceived by his own mind. When one striking object has been presented to the mind in sleep, it is so easy to imagine others that might have harmonized with it, that the latter may afterwards seem to be remembered as part and parcel of the dream, and may enter into the narrative. Even the subsequent event, the anti-type of the dream, may have attendant circumstances which were not prefigured, but which are unconsciously appropriated by the mind of the dreamer in accordance with that singular propensity, now and then experienced, to imagine that what has really happened to us for the first time, is only the repetition of what has occurred at some previous period. Bertram says in Guy Mannering, "How often do we find ourselves in society which we have never before met, and yet feel impressed with a mysterious and ill-defined consciousness, that neither the scene, the speakers, nor the subject are entirely new,—nay, feel as if we could anticipate that part

of the conversation which has not yet taken place." You remember, too, Coleridge's expression of the same idea in one of his sonnets:—

"Oft o'er my brain does that strange fancy roll,
Which makes the present, while the flash does last,
Seem a mere semblance of some unknown past,
Mixed with such feelings as perplex the soul
Self-questioned in her sleep; and some have said
We lived, ere yet this robe of flesh we wore."*

I trust it will not be thought that I have depreciated dreams, by endeavouring to divest them of some of the false interest which has been attached to them. It is right that we should endeavour to view all phenomena in their true aspects; not through the tinted media of human prejudices and misconceptions. We have warrant in Holy Writ for extreme caution, to say the least, in lending a too ready ear to the divinations of dreams; and let us hear what has been said by that orthodox divine, Jeremy Taylor, a name no less cherished by the lovers of English literature than dear to the venerators of the English Church. He is speaking of superstitious fear. "To this may be reduced the observation of dreams, and fears commenced from the fancies of the night; for the superstitious man does not rest even when he sleeps, neither is he safe because dreams usually are false, but he is afflicted for fear they should tell true. Living and waking men have one world in common; they use the same air and fire, and discourse by the same principles of logic and reason. But men that are asleep, have every one a world to himself, and strange perceptions, and the superstitious hath none at all. His reason sleeps, and his fears are waking, and all his rest, and his very securities, to the fearful man turn into affrights, and insecure expectation of evils that never shall happen. Dreams follow the temper of the body, and commonly proceed from trouble or disease, business or care; an active head and a restless mind: from fear or hope, from wine or passion, from fulness or emptiness, from fantastic remembrances, or from some demon, good or bad; they are without rule and without reason. They are as contingent as if a man should study to make a prophecy; and by saying ten thousand things, may hit upon one true, which was therefore not foreknown, although it was forespoken, and they have no certainty because they have no natural causality,—no proportion to those effects which many times they are said to foresignify." †

* Ἦν που ἡμῶν ἡ ψυχὴ πρὶν ἐν τῷδε τῷ ἀνθρωπίνῳ εἴδει γενέσθαι.
Plat. in Phædon.

† Sermon ix.

Apart from this view, there is nothing in dreams which needs to be spoken of disparagingly; on the contrary, they are a singularly interesting class of mental phenomena, capable of affording materials for study, at once profitable and engaging. Some of the questions they suggest I have endeavoured to point out, though in a manner to my own apprehension very imperfect and unsatisfactory. But I may have said enough to shew, that while they have considerable light thrown upon them by the true knowledge of the processes of waking thought, they also in their turn may contribute not a little to the science of mind. That accomplished metaphysician, Dugald Stewart, has recorded that an essay which he wrote in his youth, upon dreams, led him to those more extended researches which ended in the formation of a complete system of mental philosophy.

They are not to be spoken of lightly, if we only consider how large a component part they form of man's mental life. Think of all the children of men, from the birth of the human race; compute the amount of existence spent in dreaming life; allow only a fourth instead of a third for sleep, and out of this give only half to conscious dreaming; and even then how it dizzies the mind to comprise the largeness of the fact! Try to think only of the regions of the earth where life has been most populous. To pass over the old lands of Greece and the Roman Empire, and our modern Europe; think of the clouds of mummy dust mingled with the sands of Egypt; and remember that it belonged to beings who were dreamers, as well as builders and worshippers. Think of the people of Hindostan, and Tartary, and the Chinese Empire, and, whether you adopt their interminable chronologies, or that which is current with ourselves, it is bewildering to imagine all those generations which have sprung up like rank herbage, and decayed as rapidly. But they had all of them working hands, and busy brains, and yearning hearts, in their waking hours; and, doubtless, they too renewed the day's labour in their sleep, or shaped a fantastic visionary life.* The mere extent of the fact then alone entitles it to consideration. But facts increase infinitely in interest (it is almost a truism to remark it), according to their juxta-position. And though ourselves set free from superstition, let us, when viewing

* "Rex, quæ in vitâ usurpant homines, cogitant, curant, vident,
Quæque agunt vigilantes, agitantque, ea si cui in somno accidunt
Minus mirum est."

Accii Somnium, apud Cic. de Divin.

dreams in reference to the human species, consider how they have been associated in men's minds with oracles, and revelations, and warnings; that they have seemed to bridge over the mysterious chasm which divides us from the invisible world and its shadowy inhabitants. Let us put aside, as too sacred for discussion here, those examples narrated in the Sacred Scriptures, seeing that they belong altogether to a miraculous dispensation which takes them out of the pale of common historical phenomena; and let us contemplate them in relation only to what are commonly spoken of as the false religions of the world; those forms of faith into which men's minds have fallen by mere natural tendency, especially when actuated by those outward influences which belong to the solemn grove, the murmuring ocean, the vapour-clad mountain, the silent night, the sun, and moon, and stars. With the half-reasoning systems of prophet-sages, and the mythological creations of poets, giving something of order and coherence, and an abundance of beauty and interest, to those struggling, semi-organized beliefs which had been generated of uninformed religious instincts, or evoked by the whispers of primeval tradition, it is not wonderful that the half-real, half-unearthly phenomena of dreams should seem to accord wonderfully, and to tinge them with a colour of authenticity. The awful forms that had been presented to the waking imagination in fables, which in those simple times, and to those simple hearers had nothing fabulous, could not but often recur in the visions of the night, invested with attributes, and associated with circumstances, bearing on the dreamer's personality, and infallibly deepening the superstition.

What, for instance, must have been the dreams of men who had walked by moonlight, under the shadows of the tombs of departed kings, for the remembrance of whose greatness no works could suffice, but such as might last with the world itself; or paced the solemn avenues filled with endless repetitions of that strange form, which, perhaps, symbolized one of the great secrets of the universe; or had heard the Memnon hail the morning sun with miraculous melody; or on the plains of Thebes had looked up to those colossal Amunophs, which sit even now as if they could never be moved,—*sedent æternumque sedebunt*,—or had worshipped and partaken of unutterable rites among those pillars of Dendera, where

> "marble demons watch
> The Zodiac's brazen mystery, and dead men
> Hang their mute thoughts on the dead walls around;"

or had followed the loved and lost to the gloomy lake of the dead, and had heard the earthly rehearsal of the future trial by the forty assessors of human actions, which was to be actually undergone in other worlds, in the dread presence of Osiris! What the dreams of those who had trembled in the caverns of Elephanta or Ellora, in sight of those awful deities, into whose forms the rocks themselves seem to have grown, rather than the forms to have been carved by human hands, and there heard of Seeva the destroyer, and of the avenging Avatar of Brama! Less startling, and often lovely were the visions of those who could dream in Arcadia of scenes

> "where universal Pan
> Knit with the Graces and the Hours, in dance
> Led on the eternal spring;"

or on the banks of Ilissus, or in the shadows of Pelion, could follow the shapes of

> "Sileni, and sylvans, and fauns,
> And the nymphs of the woods and waves;"

though sometimes there might be gloomier intimations of a retributive Nemesis, and unconquerable Destiny, and even Pallas herself might "frown severe."*

It would be wearisome to my hearers to carry a like train of thought to the Scandinavian Pantheon,—to the halls of Odin, the regions of the Thunder-God,—to the Gods and Heroes of our ancestors; or across the Atlantic to those primeval cities and monuments, overgrown by monstrous forest, in Yucatan. Yet wherever we trace the footsteps of the religions of by-gone ages, we feel assured that the same tracks were haunted by the dreams of the men of old.

But it is enough to bear in mind what we experience in our own nightly visions. Dreams are much to be honoured and valued, seeing that in the wonderful shapes of thought which they sometimes present to us, we are gifted with conceptions of the ideal,—divine possibilities,—a consummation of grandeur and beauty, beyond anything which actual life can furnish;—glimpses of

> "Worlds, whose course is equable and pure,—
> ..... more pellucid streams,
> An ampler ether, a diviner air,
> And fields invested with purpureal gleams;
> Climes which the sun, who sheds the brightest day
> Earth knows, is all unworthy to survey.'

* "And Pallas frowned severe."—Landor's Hellenics. "Shades of Iphigenia and Agamemnon."

And thus, like the revelations of philosophy, the embodiments of art, and the inspirations of poetry, dreams, too, may tend to refine and sublimate our thoughts, weaning us from low desires, and raising our aspirations towards a state of existence, of which all that here is best, and fairest, and greatest, is but a faint shadow, and may be remembered in that purer world, like one of the most incomplete of our earthly visions; as a dream, in which whatever was beautiful was in fragments, in which the mean and the sublime were incongruously intermingled, and in which moral perfection was ever eluding the grasp; in which love was not free from some alloy of selfishness, nor hope unmixed with fear.

ON APPARITIONS.

THERE* are, perhaps, not many persons of education at the present period, who believe in the spiritual nature of apparitions, or who, at least, have the resolution to profess such a belief. The disposition to review them in a different light has been the slow growth of years, in some measure proportionate to the advancement of general information, and to the gradual decline of superstition. Inclined as men are, by nature and circumstances, to look upon apparitions as supernatural occurrences, the modes that have been resorted to for the explanation of them on other principles have perhaps been little calculated to satisfy the common mind. A certain degree of learning was in former times necessary, and some sort of knowledge more than usual among the lower classes, is even now requisite for the comprehension of a proper theory of these phenomena. But, independently of this want of knowledge, and without alluding to the defects in the theories that were promulgated, there has been so much discrepancy among learned men, that the less enlightened have derived but little assistance from looking to their superiors. Opinions have been for the most part divided between two extremes—absolute belief, or complete scepticism. On the one side it was matter of pious faith, that sensible manifestations of departed spirits had frequently occurred, and were liable to be presented to any individual at any moment of time; while, on the other, every narrative of a supernatural appearance was treated either as a wilful imposture,

* This paper is reprinted from "The Bath and Bristol Magazine," where it appeared in 1832.—Ed.

or as a mere chimæra, generated of fantasy and nurtured by superstition. When, therefore, the sentiments of the learned were so widely different, it is not wonderful that the world in general should have been inclined to that side to which they were directed by the natural constitution of their minds, and the bias of their acquired prejudices. Independently of these tendencies, had their minds been free and open to the conclusions of reason, it should not excite surprise that, when philosophy affected to consider as false stories what they knew (as far as any thing can be known by unimpeachable testimony) to be authentic statements; when that was indefinitely explained as the work of imagination which they had every ground for believing to have been the subject of actual sensation; when they were directed to assign to the distemperament of feverish delirium what they knew to have been presented to an individual whose pulse was calm and brain unheated, or to find in the state of dreaming a solution of that phenomenon, respecting which they had sufficient evidence, that it had often been matter of experience when the senses were busy, the muscles in action, and the mind fully alive to the presence and substantiality of an external world; and, above all, when an assertion of the physical impossibility of apparitions would have been deemed an impious circumscription of the power of the Almighty: it should not excite surprise, if the sentiments of the majority remained on the side of instinct, superstition, and belief in testimony; that the vulgar were unmoved in their prejudices; that unbiassed inquirers continued unsatisfied; that the most cautious considered belief to be the safer alternative; in short, that when the evidence of the senses was so imperfectly contested by the suggestions of reason, the former should receive more confidence than the latter.

In need scarcely be observed, that, in the present day, opinions are more nicely balanced: that a reconciliation has been effected between reason and the senses; that credulity and incredulity have mutually given way; that the ghost-seer is no longer, on the one side, branded as a liar, or ridiculed as a visionary; or, on the other, regarded as a mysterious being, who has been permitted to hold communion with the invisible world; that, in fact, the very individual may now be brought to consider his perceptions in their due relation to himself and to the nature of things. A few centuries ago, had a man been told that the sun did not travel across the sky, it would have been vain to have attempted to convince him by assuring him that he

was shackled by prejudice, or deluded by his imagination; such general and indefinite arguments (if such they could be called) would have left both the ignorant and enlightened as firm believers as ever in the actual rising and going-down of that luminary; it was necessary that certain natural laws should be developed; that the impression on the senses should be accounted for, at the same time, that the phenomenon itself was proved to be so different in its nature from what it was originally supposed to be. A similar kind of reason has latterly been applied to the subject of Apparitions; and has, accordingly, met with more success.

Before entering upon the immediate subject of this paper, it may be worth while to enumerate some of the circumstances already alluded to, as tending to determine the general belief of mankind in the reality of apparitions. And, first, may be noticed, that all but instinctive belief which men entertain of the separate existence of spirits. It is pretty generally acknowledged, that scarcely any nation, however barbarous, has yet been discovered altogether devoid of the notions of a Deity, and of a future and separate state of being. The transition from this to a belief in the possibility of the re-appearance of a departed spirit is easy and natural. Probability would alone lead the mind to it, at all events so far as to make it ready for the reception of any story that asserted the fact. Whether this belief is really instinctive, or only seemingly so, from its very early communication, it is not necessary to inquire here; but we might hazard the conjecture, that the illusions of dreams and apparitions have themselves in some instances given rise to the idea of a world of spirits, since the image of a departed friend or relation must convey to the mind of the individual who sees it the notion that the deceased is still existing somewhere, though no longer in the same state of being as formerly.

Secondly. The next circumstance to be noticed is, the frequency and authenticity of the testimonies in favour of apparitions. In every country there have been narrations of the kind, and they have met with as much credence as any other communications, and simply because the narrators were men who had been believed on other subjects, their powers of observation having been considered sufficiently acute, and their honesty unimpeachable. When a man of this description comes forward, in the full possession of his senses, and declares that certain things have been perceived by those senses, his hearers are compelled, on the same grounds upon which human testi-

mony is generally received, to believe what they are told. To this, in the majority of instances, they are the more inclined, by having themselves experienced similar visions, and by other circumstances to be mentioned presently. We ourselves, who have no faith in the reality of apparitions, do not attempt to question a great number of stories related: we believe that certain things were seen and heard; but attempt a different explanation of the causes of the sensations; we assign to internal agency what was thought to be as much the result of external impressions as any other of the sensations.

Thirdly. The circumstances attendant upon most of these appearances have been such as to render the mind less capable of distinguishing deceptions of the imagination, hallucinations, optical illusions, and the like, from real perceptions. Thus, in darkness the mind is apt to be perturbed by an indefinite apprehension of unknown dangers, and therefore less likely to form a clear observation of any occurrence; then, also, from the remembrance of ghosts having generally chosen that time for their appearance, a sort of preparation for a similar manifestation is the consequence. The place, such as the lonely scene of some atrocious deed, may excite a feeling of terror, that will alone be sufficient to prevent the judging faculty from properly exercising its office. A guilty conscience will of course have a yet stronger effect. The excitement of any passion, or of a particular enthusiasm, will act in the same manner, rendering the mind more apt to receive any impression that harmonizes with the existing state of feeling. I beg to mention that, in this place, I refer only to the predisposing influence of the passions; it will be seen in another place that they have a *direct* power of producing spectral illusions.

Fourthly. The phenomena in question have frequently seemed to fulfil some important purpose. If a warning of danger or death given by a phantom has been apparently verified; if statements have in that manner been communicated, which posterior discoveries have confirmed; the belief in the reality of the spectre would at first sight appear all but inevitable. I shall hereafter have occasion to return to this circumstance.

Fifthly. Must be enumerated that love of the marvellous, so deeply implanted in our nature. It is very well known to what lengths this passion will carry the mind; how the latter becomes willing to endure positive suffering for the sake of surprise; how children and the vulgar will listen eagerly, though shuddering, to stories that call up to them

the most appalling images; how the greatest risks to life, to fortune, to fame, and happiness, will be incurred for the gratification of the feeling; how the safety of the soul itself has been, or thought to have been, hazarded in the pursuit of the wild and supernatural. It is not wonderful, then, that the desire of excitement of this kind should strongly incline the mind to the belief in question; that it should dislike to be cheated out of this source of pleasure; in short, that on this, as on other occasions, belief should be determined by wishes. Many have voluntarily surrendered their reason to credulity, when visiting the scenes of fabulous exploits; or felt disappointed that under the insensibility of increasing years, and the damping influence of experience, the mind can no more resign itself, as in earlier and happier periods, an easy captive to visionary wonders. To the timid and guilty, the dispossession of the belief in question is no slight comfort; but individuals in whose moral texture is a union of sensibility with firmness, or still more in whom pensiveness is blended with enthusiasm, experience (especially on particular occasions) a strong reluctance to part with a fiction of such a melancholy interest.

> Grief is fantastical, and loves the dead,
> And the apparel of the grave.

How often has the churchyard been visited at solemn midnight by the heartbroken mourner, who fosters the illusive hope that the shadows of the loved and lost might come at his bidding; if but to assure him that they are happy in the land of spirits; that they continue to think with undying interest of those whom they have left still bending under the burden of the flesh, and struggling with the trials of mortal life; to tell him that love does not moulder in the grave! To how many would it be an inexpressible boon to be allowed even but a moment for pouring forth their regret in the ears of the departed (whom they will not believe to be beyond the reach of earthly accents), that they should ever have inflicted the sting of pain, or neglected occasions of affording kindness. How many such would use the imploring language of Manfred, in his pathetic address to the phantom of Astarte:—

> "Astarte! my beloved! speak to me:
> I have so much endured—so much endure—
> Look on me! the grave hath not changed thee more
> Than I am changed for thee; * * *
> Say that thou loath'st me not—that thou wilt be
> One of the blessed—and that I shall die.

"I know not what I ask nor what I seek:
I feel—but what thou art, and what I am;
And I would hear yet once before I perish
The voice which was my music— * * *
Speak to me! though it be in wrath;—but say—
I seek not what—but let me hear thee once—
This once—once more!"—

Lastly. The arguments which urge the improbabilities, according to the laws of nature, of a spirit being subject to the outward senses, are not likely to occur to an uneducated man, nor when started to be understood by him. Such appear to me to be the principal circumstances that have contributed to the popular belief in the reality of spectres.

As there have not been wanting individuals of the strongest powers of mind, and of the most refined attainments, who even in these days have clung to the notion that immaterial beings occasionally make their appearance, I trust that I shall be pardoned if I hastily run over some of the improbable assumptions which such a belief implies. If we grant that a spirit has actually been seen, we must also admit that it has assumed a material form, capable of reflecting light upon the visual organ, or of actually radiating light as when seen in a dark room, yet of such tenuity as to be imperceptible to touch, and retaining a definite form when merely supported by surrounding air; that this material form was an exact model of the body of the deceased, which body may have been at the time completely decomposed and resolved into its primal elements; that this film or simulacrum, notwithstanding the extreme fineness of its physical qualities, has the power of producing vibrations in the air as strong, as definite, and articulate, as those which are occasioned by the complicated and strongly-exerted vocal apparatus of a full-grown man; and, moreover, bearing that peculiarity of intonation which identifies it with the voice of the departed, whence it appears that the simulacrum must have an internal construction; that is, a larynx and fauces, corresponding like its external appearance with the organization of the same corrupted body; and that, finally, since we seldom hear of a ghost unprovided with the ordinary vestments, or, at least, the grave-clothes of the dead, we must allow that there may exist material spectra of garments, that have long ago mingled their dust with the ashes of their wearer, or been dispersed with the bodies of moths into almost every modification and regeneration of matter.

In addition to these considerations it may be remarked, that as numberless well-accredited cases of apparitions of living persons have occurred, and since not even the most orthodox believer in ghosts would contend that they are of a spiritual essence, it seems extremely unphilosophical to attempt to explain apparitions of the dead upon other principles. I may here introduce an anecdote, derived from a private source, and on the authenticity of which I can depend, and which bears very well upon this argument.

"You are well aware that I lived for some time in the town of ——, during the time that my friend was settled there; we were in habits of almost daily intimacy frequenting each other's rooms without even the semblance of ceremony. His health was not remarkably good by his own confessions, and to my mind his whole appearance indicated very often unequivocal symptoms of the silent attack of some slow wasting disease. At length he became aware that some decisive remedy was necessary to rescue him from the grave; and accordingly, in my absence, he took his departure to a neighbouring village. One morning, some time after this change of residence, previously to which we had not met for some days, I was passing by his room in my way to another part of the town, when I observed the casement open, and my friend standing before it, simply clad in his nightdress. His countenance was deadly pale, yet strongly expressive of that resignation which I knew he had long laboured to acquire. In order that I might convey to his mind no additional alarm, by expressing the anxiety that I really felt, I assumed a cheerful air, and addressed him with my wonted friendly salutation. Instead of the usual smile and reply, he glided by the window and disappeared, without the slightest change of look or symptom of recognition. Some few days afterwards I met my friend by chance in one of my walks, and after the usual enquiries about his health, his favourable answers to which were greatly belied by his ghastly looks, I asked him if his reverie, on —— morning, was so deep as to drown all recollection, and whether I might not take that as an excuse for his not replying to his friend's morning address. 'You were certainly,' added I, 'in great mental absence.' 'Yes,' replied he, 'and in bodily absence too, for that morning I was at ——, as my equestrian habiliments testify. 'Impossible,' rejoined I, 'for I saw you at your window on —— morning. I certainly did, or seeing is no longer believing.' His explanations, however, were too clear to allow any room for doubting their accuracy, and to my mind they were fully confirmed by his death, which occurred just six days from that on which I received this information, in the same room, and at the same hour."

It need scarcely be remarked that the appearance here related, though believed by the writer to have had some supernatural origin, could not be imagined by any one to have been the *spirit* of the individual, unless it be admitted that a soul can exist in two forms at one and the same time. It was evidently nothing more than a vivid impression on the mind of this person's friend. Whether it was excited by supernatural influence or not is another question, though, as far as

I can judge, it is sufficiently accounted for by the deep interest which the gentleman felt as to his friend's health, by the suggestive influence of the room occupied by the latter, and likewise by the probability that some preparatory train of thought had existed previously, but which was effaced by the singularity and suddenness of the fancied appearance, and not remembered afterwards. But, however this may be, does not the fact very strongly suggest, that, as a mere mental impresssion can so strikingly assume the character of an outward sensation, it is unwise to give to other appearances (differing only in the circumstance of the individual being dead) an explanation that requires the admission of *miraculous* agency ?*

The foregoing considerations are, as far as I can judge, sufficient refutations of the spirituality of spectres ; but there are other circumstances strongly tending to the invalidation of the belief. At death men undergo as great, perhaps a greater change, than when they came into the world : "is it not, therefore," asks an able writer, "as improbable that a man should return in a visible corporeal form after death, as that, after having arrived at manhood, he should return to the state in which he was before his birth ?" We never hear of a ghost making his appearance to more than one person at a time, a thing in itself very strange when the object of its appearance (as it often happens) concerns many individuals. How is it, moreover, that the phantom shall be visible only to one person of a company, but invisible to others ? So generally was this property attributed to such beings, that Shakspeare made use of it on more than one occasion. Thus, when the ghost appears to Hamlet, in the presence of his mother, while the prince's eyes are rivetted on the pale vision, she asks,

"How is 't with you ?
That you do bend your eyes on vacancy,
And with the incorporal air do hold discourse ?
Whereon do you look ?
Hamlet—On him ! on him ! Look you how pale he glares.
Queen—To whom do you speak this ?
Hamlet—Do you see nothing there ?
Queen—Nothing at all—yet all that is I see.

* It may seem almost impertinent to remind the reader that *supernatural* and *miraculous* are not synonymous terms : that the former may only imply an unearthly power still making use of natural instruments, while the latter signifies that the *means themselves* are inconsistent with the laws of nature.

Hamlet—Why, look you there! look how it steals away!
My father in his habit as he lived!
Look where he goes, ev'n now, out of the portal," &c.

Macbeth, after his agitation on seeing the ghost of the murdered Banquo in his seat at the banquet table, turns round to the guests and says,

" Can such things be,
And overcome us like a summer cloud
Without our special wonder? You make me stranger
Even to the disposition that I own,
When now I think you can behold such sights,
And keep the natural ruby of your cheeks,
When mine are blanched with fear.
—What sights, my lord?" &c.

Lastly, the probability that ghosts have any real personality is very strongly opposed by the circumstance, that, in the majority of cases, they make their communications in a manner utterly unlike what might be expected from beings sent upon a supernatural mission. Capt. Grose, in his Provincial Glossary, while ridiculing the relations of the credulous Glanvil, remarks, that

" In cases of murder, a ghost, instead of going to the next justice of the peace and laying its information, or to the nearest relation of the person murdered, appears to some poor labourer who knows none of the parties; draws the curtain of some decrepit nurse or almswoman; or hovers about the place where the body is deposited. Nor is the pointing out lost writings generally managed in a more summary way: the ghost commonly applying to a third person ignorant of the whole affair. But it is presumptuous to scrutinize too far into these matters; ghosts have, undoubtedly, forms and methods peculiar to themselves."

This peculiarity in their transactions was exemplified by the apparition of Sir George Villiers, who (as we are told by Clarendon), instead of visiting his son, the Duke of Buckingham, whose death he predicted, chose to terrify the poor steward with the warnings of his master's fate.

On taking a retrospect of the progress of the belief in apparitions, it is impossible not to observe how deeply it has been involved in the various forms and modifications of religion; that at different periods they interchanged assistance; that the impugnment of the existence of the one was ranked with an attack on the validity of the other. This close connection must obviously have taken place from the very nature of the subject. When, as in the classic mythology, not only the separate existence of spirits was taught, but also their interference in

the affairs of the world, under the character of gods and demigods (many of them having themselves been mortal), espousing the cause of particular nations, and forming connections with the human race, it was all but implied that the spirits of the dead may occasionally revisit the earth. The same holds good with the mythology of the barbarians. There is no doubt that the exciting narrations of the poets, to whose purposes apparitions are so serviceable, would increase the tendency of the superstition, and impress the belief in question more strongly upon their minds. But, independently of the actual association of the belief with the superstition, it may be remarked, that the very nature of the latter would dispose the mind to the former, inasmuch as it consisted comparatively so little of rules for the restraint of the passions, and the direction of conduct; and, on the other hand, contained so much that was adduced to the senses and the imagination rather than to the understanding. In addition to this, the mind, under its influence, became so familiarized with prodigies and remarkable occurrences, that an easy explanation (*divinitùs ortum*) was always at hand for any strange or marvellous story—so easy, that to question the fact was to doubt the power of the gods. If the philosopher chanced to shake off this religion, the belief in apparitions departed with it. Everybody knows that Lucian, an atheist, ridiculed ghosts. Lucretius, like his master, Epicurus, a disbeliever in the immateriality of the soul, though compelled to admit the facts of apparitions, found reasons, that will be referred to hereafter, for denying their real existence. The philosophers whose speculations did not assail religion admitted the existence of spirits, and their influence on the minds of men: such were Pythagoras, Socrates, and Plato. Christianity brought nothing to dissipate the belief that we are discussing. Teaching nothing that would merely gratify the curiosity of man, and satisfied with communicating those precepts and principles that concerned his future destinies, it never interfered with opinions that were not essentially inconsistent with its vital truths; neither advancing nor retarding those branches of knowledge that were apart from its own sublime and peculiar doctrines. While, therefore, its propagation swept away the polytheism of Pagan superstition, it left untouched those opinions respecting spiritual intelligences, which were dispersed among different nations, and which made up their various systems of demonology, so long as the unearthly beings were considered subordinate to, and merely permitted to exist by, the will of the one God; much less did

it inculcate the impossibility of apparitions; but, on the contrary, rather encouraged it; at least so far as the relation of *miraculous* occurrences of the kind had a tendency to do so.

In the dark ages, when Christianity was degraded to so near a similarity to Paganism; when its priesthood, instead of informing the understandings of the people by the elevating truths contained in the Sacred Writings, preferred the more profitable scheme of teaching just so much of the religion as would enable them to maintain their dominion over the vulgar mind; and when the readiest method of fulfilling this plan was, to associate with certain delusions of the senses and excitations of the imagination, the particular notions which it best suited their purpose to propagate; it is not surprising that the natural tendency of the human mind to believe in spirits, goblins, fairies, apparitions, and the like, should have been encouraged and moulded to their own wishes; that they should have feigned that supernatural sounds had attested the truth of their miraculous impostures; that they had been gifted with the power of communicating with angels and struggling with devils; that to their favoured eyes revelations and visions had been unfolded, which elevated them to the character of men set apart from the rest of the unholy world; that they had conversed with the souls of the departed, and thus become the depositaries of momentous secrets. In short, we cannot wonder that they should have had such ready means of convincing their fellow-creatures of their irresistible claims to the most prostrate veneration and submission. The jealousy of these ambitious and insolent priests over such exhaustless sources of power and influence, urged them to menace ecclesiastical terrors against all impeachers of the credibility of their stories; denouncing an unbeliever in miracles and supernatural agencies as a foe to religion, and an alien from the Church. So freely had the Romish ecclesiastics resorted to every invention of mysticism, that after the Reformation the belief in spirits, demons, ghosts, and fairies, was so identified with the errors of Popery, though not essentially connected with them, that many Protestants, in the first freshness of their intellectual freedom, determined to regard them all as the creations of ignorance, the phantoms of superstition, and the illusions of crafty impostors. Reginald Scot, in his Discovery of Witchcraft, declaims most contemptuously against the whole race of elves, fairies, sprites, hags, witches, ghosts, hobgoblins, pucks, robin goodfellows, and the like.

But though the delicate fairies were thus roughly dismissed, and hobgoblins and chimeras put to flight, witches and ghosts were not so soon to loose their hold on general faith. The causes which detained the former, it does not come within the limits of our plan to discuss; the latter were too closely interwoven with the histories of families and individuals to be thus forgotten: they had not merely been constant dwellers in the land of fancy, but had almost as frequently seemed to have taken part and action in the real visible world; to have mingled their deeds with those of men; to have foretold, if not hastened, the most momentous of events. Addison, in speaking of the poetry connected with spiritual beings, says,

"There was not a village in England that had not a ghost in it; the churchyards were all haunted, every large common had a circle of fairies belonging to it, and there was scarce a shepherd to be met with who had not seen a spirit."—*Spectator*, No. 419.

In addition to these incitements to belief, they were again to be linked hand in hand with religion; nay, to support and defend her from assailants. In the middle of the last century, when free thinking became rife, the advocates of Christianity, zealous to avail themselves of every weapon, were rejoiced to discover in the existence of ghosts an inexpugnable argument against materialism and infidelity. Since that period the belief has been gradually declining—with the accelerated decline of superstition, with the restriction of the imagination to its proper bounds, the cautious examination and admission of facts, the exposure of frauds and impostures, and the progress of physical science in general. Since researches in the material world have been conducted, not as in former ages for the discovery of results by vague processes of undirected experiment; results that might contribute to the profit of the investigator, and about which it was to his interest to accumulate as much secrecy as possible; since the qualities of matter and their mutual action and re-action have been studied on the nobler principle of elucidating the operations of Nature, discovering the laws of her action, and testing the universality of those laws, a spirit of openness has been diffused into these inquiries, and the avidity for finding out certain occult peculiarities has been exchanged for the desire of reducing them to a consistency with the usual laws of matter. It is obvious that this spirit would extend to the observation of Apparitions; that the mind, even rather than minister to the instinctive love of the marvellous, would feel pride at explaining, on

general principles, phenomena hitherto regarded mysterious and inscrutable.

We may here notice that many popular modes of depriving ghost stories of their supernatural assumptions have been offered unsuccessfully. The cause of their failure has been the want of universality in their applicability. In some cases, however, they afford a sufficient solution. Thus false or exaggerated relation is enough to account for a great number of stories. Interested purposes, such as the concealment of crimes, pretended revelation of secrets, affectation of miraculous power, imputation of false charges, &c., have obviously suggested the fabrication of tales of this description. In other instances the narrator, without any intention to deceive, has given the principal circumstances correctly; but unconsciously omitted an apparently trifling fact that would have satisfied more discriminating minds of the delusion; or, as Sir Walter Scott acutely observes,

"He is asked some unimportant question with respect to the apparition; he answers it on the hasty suggestion of his own imagination, tinged as it is with the belief of the general fact, and by doing so, often gives a feature of minute evidence which was before wanting, and this with perfect unconsciousness on his own part."—*Scott's Demonology*, p. 356.

Many stories have been referred, and with justice, to a want of sufficiently correct observation. Thus individuals have seen appearances which they have at once believed to be supernatural, from having been prepared for their reception either by the prejudices of superstition, or by some other previous state of feeling; they have therefore neglected to make further investigation, or have been rendered incapable of doing so by the perturbation of fear or surprise. Years have often passed away before the development of a fact which reduces the whole occurrence to a natural character. *Imagination* has been made to bear the weight of unnumbered ghost stories; but the fault has been, that in the popular manner of interpretation, the nature of the operation has not been sufficiently developed. Most persons have satisfied themselves with the name, merely associating with it a vast number of unrealities, whether day-dreams, night-dreams, visions, air-castles, or other things well known to be imaginary; and have accordingly been ready to attribute any related occurrence, not immediately explicable on physical principles, to the same origin. This method has been highly attractive and very generally adopted, because of its convenience, and because it requires no tedious intellectual analysis. But he who has contented

himself with so short and easy a way of getting rid of supernatural mysteries, must frequently have been hard pushed by narratives of appearances that occurred under circumstances unfavourable to any extraordinary excitement of the imagination. Thus spectres have been witnessed during the individual's employment about the sober mechanical avocations of life, the dullest realities of this "working-day world" with the senses, those usual watchers against deception, in full exercise, and the judgment in perfect tone and readiness. Such cases are sufficiently difficult for the interpreter, who can only call them delusions of the fancy, meaning by the term nothing more than a faculty of cheating the mind into belief of deceptions, and whose best opportunities are during the slumber of the senses and the suspension of the reason. No wonder then that from an improper, or rather a defective use of this mode of explanation, it has often been baffled and fallen into discredit; since the assumed explanation is but a varied expression of the fact. It is easy enough to say that an appearance was all phantasy; but such assertions do not convice the individual that it was *impossible* that what he has seen and heard could have had any reality; that is, any existence independent of his own mind. He will not by these means be directed to a consideration of the opposite qualities of matter and spirit, nor will it in that way occur to him that the organs which connect us with the external world are fitted for the reception of material properties only, and that, although immaterial essences *may* be exterior to us, we are not provided with the means of perceiving their attributes. *Hallucinations, or errors of vision,* have very properly been resorted to for the explanation of many cases. The cases of this kind may be denominated Pseudo-Apparitions, or those resulting from mere optical illusions; in other words, produced by causes connected with the organ of vision, and the action of light upon it. Of this kind are alterations of the media, whether of the air or of the membranes and humours of the eye, by which size and colour are modified, and even particular spectra produced; certain conditions of light, fluctuation of the medium giving the appearance of motion, &c. Burton was well acquainted with them. He tells us,

"Osiander beheld strange visions, and Alexander ab Alexandro, both in their sickness, which he relates. Albategnius, that noble Arabian, on his deathbed saw a ship ascending and descending, which Fracastorius records of his friend Baptista Turrianus. Weak sight and a vain persuasion withal, may effect as much, and second causes concurring, as an oar in water makes a refraction, and seems bigger, bended double, &c. The thickness of air may cause such effects; or any object not

well discerned in the dark, feare and phantasie will suspect to be a ghost, a divel, &c. Quod nimis miseri timent, hoc facile credunt, we are apt to believe and mistake in such cases."—*Anat. of Mel.*, Vol. I. p. 312.

To us such agents are familiar enough in the narratives of those striking phenomena, the Giant of the Brocken, and the Fata Morgana; or perhaps in our own individual experience. Few persons have not at some periods of their lives imagined that they saw a ghost in the trunk of a beech tree, in a sign post on a dreary common, or in a newly whitewashed gravestone; or perchance, been pursued like Bloomfield's old woman, by a demon donkey. Mr. Ellis tells a story of the walking ghost of a cook, seen by a ship's company to follow the vessel, and found afterwards to have been caused by the floating of the body half raised above the water. Dr. Ferriar relates an anecdote of a gentleman, who arriving late at a solitary inn by the road-side, demanded a lodging for the night. He was told that all the rooms were occupied, except one in which a pedlar had recently committed suicide; and which, in consequence of being haunted by his ghost, had been deserted. The gentleman determined, however, to brave this horror, rather than pursue his journey at so late an hour, and retired to rest. Being fatigued he soon fell asleep, but imagined that he had not been long in that state when he awoke, and on looking to the opposite part of the room, beheld the ghastly phantom of the pedlar standing against the wall. His first emotion was that of extreme terror; but summoning up his resolution, of which he possessed a considerable share, he got out of bed to examine the spectre more closely; and on approaching it, found that the illusion was produced by the moonlight playing in a particular manner upon the wall. The optical deception was here, as in most other cases, evidently assisted by the previous preparation of the mind. Sir David Brewster also has pointed out a particular kind of optical illusion. From his observation of the phenomena of indirect vision and the effect of light, when in great tenuity, under both which circumstances objects are apt to be alternately visible and invisible, he very justly suspects that many phantom tales may be accounted for by them; since few things would be more likely to suggest impressions of a supernatural nature to a person walking in a faint light, than the sudden alternate disappearance and reappearance of objects.—*See Brewster's Journal, No. II., and his Treatise on Optics.*

Having thus touched on some of the more common methods adopted

in the explanation of ghost stories, we now, in the progress of our inquiry, proceed to notice opinions which entered somewhat more minutely into the explanation of the appearances in question. It was a doctrine taught by Epicurus, and powerfully enlarged upon by Lucretius, that man is an uncompounded being, his body and soul being inseparate; the one consisting of matter in a cruder state, the other of matter also, but far more refined and subtilized; and that analogy does not lead to the notion of a future condition of existence. With this doctrine a belief in the possibility of the appearance of spiritual beings would be utterly incompatible. But that phantom figures of dead men had been witnessed, was a fact so well confirmed, that these philosophers did not attempt to dispute it. Lucretius admits the facts, but immediately hastens to guard against the inference, by explaining the former on material principles. Thus in the 4th Book he says,

> "Centauros itaque & Scyllarum membra videmus,
> Cerbereasque canum fauces; simulacraque eorum
> Quorum, morte obitâ, tellus amplectitur ossa:
> Omne genus, quoniam passim simulacra feruntur,
> Partim sponte suâ quæ fiunt aere in ipso,
> Partim quæ variis ab rebus cumque recedunt,
> Et quæ conficiunt ex horum facta figuris."—732—738.

It is in this book that the author propounds his theory of sensation; the sum of which is, that εἴδωλα, effluvia, simulacra, exuviæ, films, (or by whatever names these images or outer coats of objects may be called), are constantly emanating from surrounding bodies, and by striking the organ of sense, produce perception. In conformity with this principle, if allowed, it is easy to suppose that such films or images are thrown off from corpses; that by their tenuity they pass through media of earth or marble, and arrest our attention when we are less affected by forcible images immediately surrounding us, as in the silence of solitude, or in the deep quiet of midnight. These species, he says, are so fine, that they may penetrate through the body to the mind without first impinging on the sensific organ; and in this manner he explains their appearance in dreams.

Cicero alludes to this Epicurean mode of explaining the presentation of the forms of absent individuals, in a letter addressed to Cassius. Lib. xvi. Epist. 4. He ridicules the doctrine, by asking whether, on thinking of any object, as the Island of Britain, an εἴδωλον

or film of the said island flies to his breast. "Si insulam Britanniam cœperis cogitare, ejus εἴδωλον mihi advolabit ad pectus."

But Cassius, who espoused the doctrines of Epicurus, made use of them, we are told by Plutarch, to quiet the apprehension of Brutus after the appearance of the ghost of Cæsar; reminding him that phantoms are of the nature of dreams, which consist of the films of objects presented to the mind when in a state of great tranquillity and abstraction. Pliny, in one of his Epistles, tells two or three interesting ghost stories. I have translated one of them, to shew how much tales of this description resembled so long ago those current in more recent times.

"There was a large and roomy house at Athens that acquired a bad character from the following cause. At dead of night there was wont to be heard a noise like the clanking of chains, which, if you listened attentively, appeared to come at first from some distance, and gradually to approach nearer; soon after this there would appear the figure of an old man, emaciated and of squalid aspect, with a long flowing beard and bristling hair, with fetters on his legs, and manacles on his wrists, which shook as he walked along. The inmates spent many miserable nights, not going to bed from terror; and their alarm became so great that some were taken ill and died; for although the spectre did not appear in the day-time, the remembrance of the nightly visitation continued to haunt their sight. At length the house was forsaken, given over to solitude, and, in fact, abandoned to the ghost: a notice however was put up that the house was to be disposed of, in case any one not happening to know the history of it should be inclined to become a purchaser or tenant. A philosopher, by name Athenodorus, having come to town, observed the notice; and as the price seemed very low, made enquiries as to the reason of its being so; and having been told the circumstances, was on that very account more anxious to hire the house for a time. In the evening he ordered his bed to be made in the best room, and a lamp, with writing implements, to be furnished. Having dismissed his family to the other parts of the dwelling, he busied himself with writing, in order that his mind might not, for want of other occupation, be imagining mere phantasms. At first the night seemed as still as usual, but by-and-bye he heard a noise as if from the clanking of fetters; he did not look up, or leave off writing, but summoned up his resolution, and closed his ears. The noise however increased, and approached so near as to seem to be at the threshold; he then looked behind him, and beheld the figure before described, which then stood still, and beckoned to him with its finger. The philosopher made a sign to it to wait a little, and betook himself again to his tablets; but while he was writing, the spectre made such a clatter with the chains about his head, that he again turned round and saw it beckoning as before. Upon this he delayed no longer, but took up the lamp and followed the ghost, which walked very slowly, as if weighed down by its fetters. On coming into the area it suddenly sunk downwards and disappeared; and Athenodorus took care to mark the spot with some leaves that lay about. The next day he summoned a magistrate, and advised him to have the place dug; which being done a skeleton was found with chains about it,

the flesh having mouldered away. The bones were collected and buried with proper funeral rites; after which the house was no longer haunted."

Pliny expresses himself to be in such a state of doubt as to the true nature of these and other *φαντάσματα*, that he begs his friend not only to discuss the subject fully, but to give a decisive opinion one way or the other.

The ancient Mythological division of our spiritual constitution into Manes, Spiritus or Animus, and Umbra, afforded a ready explanation of spiritual appearances. By the term *Manes* was understood the soul that is destined for the lower region; the *Spiritus* was admitted into the abodes of the blest; while the *Umbra* being the corporeal soul, was condemned to remain in the vicinity of the body. There are four lines, commonly attributed to Ovid, which state concisely the nature and destination of these imagined principles of human nature.

"Bis duo sunt homini: Manes, Caro, Spiritus, Umbra.
Quatuor ista loci bis duo suscipiunt;
Terra tegit *carnem*, tumulum circumvolat *Umbra*,
Orcus habet *Manes*, *Spiritus* astra petit."

It does not appear that for many centuries after the Christian epoch any particular opinions were broached respecting the nature of ghosts; in fact, they were never thought to be other than what their appearance denoted; that is, the actual spirits of deceased individuals. The only variation appears to have been, that a particular kind of devils occasionally assumed the forms of the departed, or that the devil had the power of working upon the imagination by vitiation of the humours, so as to make men fancy they saw chimæras and ghosts. Burton, in his chapter on the nature of divels, as he terms them, after stating the division of spirits into aerial, fiery, water-devils, terrestrial, and subterranean, says, that the terrestrial

"Many times appear to men, and affright them out of their wits; sometimes walking at noonday, and sometimes at nights: counterfeiting dead men's ghosts, as that of Caligula, 'which' saith Suetonius, 'was seen to walk in Lavinia's garden; where his body was buried, spirits haunted, and the house where he died: Nulla nox sine terrore transacta donec incendio consumpta: every night this happened; there was no quietness till the house was burned.' About Hecla, in Iceland, ghosts commonly walk: animas mortuorum simulantes." See vol. i. p. 69.—*Anatomy of Melancholy.*

We cannot pass without notice an hypothesis, that was proposed in the early part of the seventeenth century, to the last degree preposterous. A sort of philosophers, who from their peculiar doctrine

were called Palingenesians, imagined that they had discovered with sufficient certainty that the substantial form of any organic body was contained in a particular volatile salt, and that on the application of heat and matter containing this salt, the latter was exhaled; that in this process the saline particles assumed that kind of arrangement to which they had been accustomed in the living body, and that thus a regeneration was accomplished. On the removal of heat the vapour condensed, and the form was lost. Experiments were said to have been frequently tried on the ashes of flowers, and by due attention to the operation, an apparition of a defunct flower might be seen floating in the air above the crucible, and corresponding with the original to the minutest particular of leaf, petals, and stalk. A transition by analogy from this doctrine to an explanation of spectral appearances, was far too easy and natural to escape the acumen of these subtle speculators. The frames of buried men might have long since mouldered into dust, but that dust contained the regenerative salt, the phœnix-like principle; heat was ever at hand in the surrounding earth from various kinds of fermentation; the saline corpuscules were volatilized and made their escape into the free air; there they arranged themselves into the figure of the former animated body, and in short, represented its ghost, which might either, as most commonly happens, hover about the grave, or be translated by wafting winds to any given situation. But the Palingenesians did not satisfy themselves with mere *à priori* arguments, albeit so conclusive. Bent upon making assurance doubly sure, they resolved, with true inductive rigour, to put the theory to the test of an *experimentum crucis*. Accordingly it is related, that from the crucibles of three alchemists, spirits were successfully evolved in the guise of the sublimated salts. A Jesuit is said to have powdered a piece of cranium, and another to have merely heated some blood, and the results, such as visions of detached heads, limbs, or whole figures, were equally confirmatory of the doctrine.* Sir T. Brown gave into this delusion, as appears in the following passage from his Religio Medici:—

"A plant, or vegetable, consumed to ashes, by a contemplative and school philosopher, seems utterly destroyed, and the form to have taken his leave for ever; but to a sensible artist the forms are not perished, but withdrawn into their incombustible part, where they lie secure from the action of that devouring element. This is made good by experience, which can from the ashes of the plant revive the plant, and from its cinders recall it into its stalk and leaves again."—P. 109.

* See Hibbert on the Philosophy of Apparitions.

About the same period many philosophers were convinced that they had discovered the nature of ghosts in Astral spirits, or corporeal souls, as they were termed, and which were nothing more than the actual forms of external bodies, and which are conveyed by the senses into the mind, where they are stored up and become ideas. These ideas will not be confounded with what *we* call ideas, and which we confine within the limits of the mind: the ideas synonymous with Astral spirits might be altogether external. Thus the story of a shower of frogs having occurred was considered to be sufficiently accounted for by saying that it was a shower of ideas of frogs. The appearance of the rose in the Palingenesian experiment was the idea of the rose; and ghosts were the Astral spirits or corporeal souls, or ideas attendant upon corpses.

We have remarked that the imaginative faculty has been constantly referred to as the source of spectral appearances. Burton explains the action in the following manner, conformably with the opinions of several old authors:—

"To our imagination cometh by their outward sense or memory some object to be known (residing in the foremost part of the brain) which he, misconceiving or amplifying, presently communicates to the heart, the seat of all affections. The pure spirits forthwith flock from the brain to the heart, by certain secret channels, and signify what good or bad object was presented; which immediately bends itself to prosecute or avoid it, and withal draweth other humours to help it. So, in pleasure, concur great store of purer spirits; in sadness, much melancholy blood; in ire, choler. If the imagination be very apprehensive, intent, and violent, it sends great store of spirits to or from the heart, and makes a deeper impression and greater tumults."—Vol. i. p. 132.

He then shews that the humours in the body may have been ill-concocted, or be in excess, and accordingly bad spirits are thus sent from the heart, and very much interfere with the work of the imagination. Then it is seen imagination re-acts upon the heart, "misinformeth it," causes alteration and confusion of spirits and humours, so that other parts cannot perform their functions, and we may look at things and not see them at all, or see them perverted. This amusing author attributes great power to the influence of the imagination of one person over that of another.

"Why do witches and old women," he asks, "fascinate and bewitch children? but (as Wierus, Paracelsus, and many philosophers, think) the forcible imagination of the one party moves and alters that of the other."—Vol. i. p. 138.

Lavater believed that imagination could act on the mind of another

at any distance, so that the imagination of a dying man might produce in the mind of an absent friend a vivid idea of the visible shape of the person from whom it emanated.

Isaac Walton, in his life of Dr. Donne, after a full account of a vision that was presented to this gentleman during his sojourn in France, adds the following curious observations :—

"This is a relation that will beget some wonder, and it well may, for most of our world are at present possessed with an opinion that visions and miracles are ceased. And though it is most certain that two lutes being both strung and tuned to an equal pitch, and then one played upon, the other that is not touched being laid upon a table at a fit distance, will, like an echo to a trumpet, warble a faint audible harmony in answer to the same tune ; yet many will not believe there is any such a thing as a sympathy of souls, and I am content that every one do enjoy his own opinion. But if the unbelieving will not allow the believing reader of this story a liberty to believe that it may be true, then I wish him to consider that many wise men have believed that the ghost of Julius Cæsar did appear to Brutus, and that both St. Austin and Monica his mother had visions in order to his conversion."

Sir T. Brown was of opinion that ghosts are the production of evil spirits. His words are,

"Apparitions and ghosts of departed persons are not the wandering souls of men, but the unquiet walks of devils, prompting and suggesting us unto mischief, blood, and villany, instilling and stealing into our hearts." * * * *
"That those phantoms appear often, and do frequent cemeteries, charnel-houses, and churches, it is because those are the dormitories of the dead, where the devil, like an insolent champion, beholds with pride the spoils and trophies of his victory over Adam."—Relig. Med. p. 86.

Sir Kenelm Digby, in his annotation on the above, states a different opinion. He thinks that souls retain a sort of affection for the bodies which they have left behind ; or, to use his own words, they

"Do retain still even in their separation a bias and a languishing towards them, which is the reason why such terrene souls appear oftenest in cemeteries and charnel-houses, and not that moral one which our author giveth." He adds, "The impossibility cannot cure them of their impotent desires : they would fain be alive again,

Iterumque ad tarda reverti
Corpora—Quæ lucis miseris tam dira cupido."

Hobbes would have it that all apparitions might be explained as the accompaniments of dreams. "These," he says, "are often so short, that we are not conscious of having slept." He applies this doctrine to the story of the ghost of Cæsar. He says :—

"Considering the circumstances, one may easily judge it to have been but a short dream. For Brutus, sitting in his tent pensive and troubled with the horror of his

rash act, it was not hard for him, slumbering in the cold, to dream of that which most affrighted him; which fear, as by degrees it made him wake, so it must needs make the apparition by degrees to vanish; and, having no assurance that he slept, he could have no cause to think it a dream, or anything but a vision."

Glanvil, a credulous author of the seventeenth century, in his Sadducismus Triumphantus, endeavours to prove the existence of apparitions on religious principles; that to deny the reality of apparitions and witchcraft was to disbelieve in spirits, a life to come, and other essential sacred doctrines.

Mr. Andrew Baxter, in his treatise on the nature of the soul, attributed the origin of apparitions to the work of separate immaterial spirits of superior intelligence, who have the power of presenting the images to our minds in the same manner as dreams. He thought that, although Deisidaimonia has been much abused by vain and weak-minded people, and perverted to bad purposes by the artful and malicious, the most rigorous philosophy cannot reject them. Had Baxter not considered it necessary to introduce the action of spirits, and had he traced the production of such ideas in the sensorium to the natural constitution of the human mind, his opinion would have differed very little from the modes of interpretation for the most part adopted in the present day.

I am indebted to Mr. Hibbert's work for the opinion of Dr. Meyer, who wrote in 1748. He imagined that ideas, or material forms, stored up in the memory, might find their way to the organs of sense, and impress them; thus the idea of a deceased individual might reach the optic nerve, and thereby produce spectres.

It is scarcely necessary to remark, that such well-known writers as Addison and Johnson assented to the general belief in ghosts. They, both of them, founded their conviction on the ground of universal attestation. The former allowed these horrors to be often the result of misapprehension, perverted association, disturbed imagination, and the like; but added,

"At the same time I think a person who is terrified with the imagination of ghosts and spectres much more reasonable than one who, contrary to the reports of all historians, sacred and profane, ancient and modern, and to the traditions of all nations, thinks the appearance of spirits fabulous and groundless."—*Spectator*, No. 110.

Johnson insists on the same position in a variety of places, as in his discussion of Second Sight, in his tour to the Hebrides; and in the

many occasions of conversation upon the subject, as reported by Boswell. In Rasselas, Imlac is made to state the argument thus—

"That the dead are seen no more, I will not undertake to maintain, against the concurrent and unvaried testimony of all ages and of all nations. There is no people, rude or learned, among whom apparitions of the dead are not related and believed. This opinion, which, perhaps, prevails as far as human nature is diffused, could become universal only by its truth; those that never heard of one another would not have agreed in a tale which nothing but experience can make credible. That it is doubted by single cavillers, can very little weaken the general evidence; and some who deny it with their tongues, confess it by their fears."

It is needless to quote any other passages in demonstration of the opinions of this extraordinary man, whose mind is so often referred to as a specimen of the mixture of prejudice and superstition, with habits of rigorous deliberation and research. I cannot help thinking, however, that there was no necessity for the interposition of a superstitious bias to decide his judgment. Like Addison, he does not appear to have directed his attention to the physical difficulties of the subject, nor does it seem to have occurred to him, that conceptions of sensible objects may, by various circumstances, become so intense as to excite a conviction of their reality, exactly equivalent to that produced by objects actually subjected to sensation. He, therefore, required no inclination to the mysterious in order to receive the simple argument of universal consent: since it was necessary either to impugn it altogether, or to find some method of explaining it away. The fact is, that this universal testimony implied not only facts, but assumptions. Thus people in all ages have avowed that they have experienced certain visual perceptions, resembling the forms and faces of departed individuals. This part of their statement was matter of fact; but when they asserted the phenomena to have been spirits, they were indulging in a sort of unconscious dogmatism, which ought to be weighed when we are estimating the value of their testimony. Nevertheless, it cannot be denied that, as it happened, the mind of this remarkable man was disposed to the supernatural. His disposition to abstract contemplation must have led him to look with interest at any communication between the invisible world and that surrounding him; and more than this, his constitutional melancholy, aggravated by sedentary habits, threw a shade of hypochondriacal timidity over his religion, which caused him at all times to lean rather to the side of superstition than to run the risk of incurring the displeasure of supernal powers, by withholding his assent from mysteries, which, if difficult to

elucidate, were only so from their elevation above the range of all human comprehension.

About the year 1810 Dr. Ferriar published his work entitled, An Essay towards a Theory of Apparitions. The chief merit of this work is, that it is a very interesting collection of cases of spectral impressions, proved to be independent of an agency external to the individuals who were the subjects of them, and, in a great proportion of them, to have been connected with certain bodily conditions. At the commencement he refers to the law of the economy, whereby an impression may remain on the retina after the removal of the impressing cause; and, in the course of the work, endeavours to shew that, under certain morbid dispositions of the brain, these impressions are more liable to be renewed. The hypothesis is scarcely at all developed; and many facts are mentioned which it is incapable of explaining.

Since this publication, Dr. Hibbert has sent forth his philosophy of apparitions. He treats the subject with great elaborateness and ingenuity; and, although I do not myself feel inclined to follow him through all the subtleties of his speculations, the work must, I imagine, be allowed by all who have perused it, to contain a far greater mass of information, and, on the whole, more philosophical reflections, than any other treatise on the subject.

Sir W. Scott's popular letters on Demonology and Witchcraft do not require any thing more than mere mention at the end of this hasty summary of opinions.

The general view which appears to me to afford the best interpretation of these phenomena, is this; that they consist of ideas of sensible objects, derived either from memory or imagination, but vivified to the intensity of perceptions resulting from impressions on the organs of sense. This view differs from Dr. Hibbert's, insomuch as he confines them to ideas simply reproduced, thereby leaving no room for ideas created, or, rather, newly combined by the imaginative faculty. Dr. Bostock, in an Appendix to his Physiology, mentions that he was himself, when out of health, visited by some spectral figures; but he particularly specifies that the shapes and features were entirely dissimilar to any thing that he had before perceived. In a healthy state of mind, ideas of sensible objects are, as every one knows, very inferior in vivacity to actual impressions. Were not this the case, we should frequently be at a loss to know how to distinguish a remembered or fancied image, from that of a thing

really and substantially presented to our senses. The external world would be confounded with the internal; the past would no longer wear a shadowy aspect, nor the present be recognized by the brightness and liveliness of its colouring. But there are certain conditions of mind in which a remembrance is endued with the hues and lineaments of an immediate object of sense, and a mere creation of fancy assumes such strength of outline and completeness of parts, as to seem a reality. The ghost, then, of a departed individual, is nothing more than his recollected image, so preternaturally vivified, as to be mistaken for an external visible object; and, in like manner, his voice is only a collection of renewed impressions of sound, of an equal intensity with what they formerly possessed when produced by vibrations of air affecting the auditory nerve. In such cases, it is manifest that the ordinary balance between perceptions and ideas is altered; that there is an unnatural excess of one series of mental phenomena over the other; in fact, that the mind, from some cause or other, labours under disease. The suddenness of accession, and the transitory continuance, do not interfere with this view, since the body, when deranged in its functions, for however short a time, is, strictly speaking, in a morbid condition; an all but momentary fit of dyspnœa, a sudden pain darting through the head, a sensation of faintness, are all specimens of disease, that is, deranged function. But if disorder of the mind constitutes insanity, it would be verbally correct to say, that the individual who sees a ghost is, during the vision, nothing more or less than a temporary lunatic. Those who have read Sir Walter Scott's Letters on Demonology and Witchcraft, will remember that he draws a distinction between insanity and ghost-seeing, although he allows that the latter may be the means of inducing the former, and *vice versâ*. He considers that spectral illusions are occasioned by errors in some part of the apparatus of vision, in the same manner that other false notions are produced by aberrations in the other senses, as those of taste and smell. He then shews how similarly false ideas may arise, not from derangement of the sense, but from a defect in the *mind only*, which he says is the case in insanity. In other words, the mind of the ghost-seer is betrayed by some aberration in the organ of sense; but, as Sir W. himself expresses it,

"In cases of insanity, the *mind* of the patient is principally affected, while the senses, or organic system, offer in vain to the lunatic their decided testimony against the fantasy of a deranged imagination."

In illustration, he adduces the case of a poor maniac, in the Infirmary of Edinburgh, who fancied that he sat down every day to a sumptuous banquet, "though, somehow or other, every thing he ate tasted of porridge." This distinction, it appears, depends altogether on the opinion that Apparitions *are* produced by derangement in the sensific organ, to a certain degree, independently of the mind; but if we regard them as the results of causes not necessarily connected with the outward organ, the distinction will not hold good. But without insisting on this, there are many cases of insanity itself, particularly those belonging to the division of Monomania, which are the effect of disordered perception, the mind itself having previously been considered sound, and being actually so on all other subjects. Thus one man is troubled with a sensation, that his legs are so extremely soft, that they must be enclosed in a box, lest they should be melted by the approach of heat; and another feels his nose to be so large, that in walking the streets, he calls out to drivers of carriages to beware of running against it; in these instances, the conviction produced by sensation is so strong, that the judgment has no power to resist it. Insanity is, perhaps, the vaguest of all terms. In strict philosophy, it ought to include every instance of disordered mental action, and then none would be secure from the application of it, at least at some few periods of their lives. But the painful nature of certain degrees of insanity has occasioned the restriction of the term to such kinds of derangement, as induce a belief in things morally and physically impossible, or a belief utterly at variance with universal belief, and therefore rendering the individual unworthy of trust; or such as lead to sudden deviations from the usual manners, habits, and conduct, either of himself, or of society in general. If, then, we confine insanity to that sort of aberration which bears these characteristics, and others of a similar nature, that might be mentioned; and, in fact, apply the name, not so much to mere disordered mind, as to that state of mind which produces certain results, principally of a practical nature; it must be allowed, that disordered perception is not enough to constitute a man a lunatic, till it has deceived him into certain belief or actions; and so far the separation of spectral illusions from insanity is correct: but it is evident that it cannot be founded on any opposition of the essential mental conditions, but merely on the intensity of the perception, which might, under certain circumstances, acquire sufficient strength to pervert the judgment to such an extent, as would warrant

the imputation of insanity. The unfortunate gentleman, who was constantly persecuted by the vision of a skeleton, and whose melancholy narrative is strikingly related by Sir W., might, with less self-control, or even less caution in communication, have easily been betrayed into conduct and conversation, that, in the opinion of spectators, would have been held sufficient ground for the suspicion of lunacy. I observe that Celsus makes one of his subdivisions of insanity to consist of spectral illusions; and he specifies that the judging faculty is unimpaired. His words are "quidam imaginibus, *non mente* falluntur; quales insanientem Ajacem vel Orestem percepisse poetæ ferunt."*

To return from this digression. In order that we may better develope that derangement of the mental phenomena in which ghost-seeing originates, it will be well to take a moment's glance at the healthy conditions of sleep and waking, and the various deviations from them: those from the former being Dreams, Somnambulism, and Sleep-talking; and those from the latter, Reverie, and the disorder which we are considering. Sleep and waking are not placed at the heads of different classes of occurrences, as if opposed to each other, for the one is only negative of the other; but they are thus arranged for the sake of convenience, because the other two sets of conditions are those into which they respectively pass. They all, however, individually differ from each other as it respects the relation between sensation and motion on the one hand, and thought on the other. Let us look at the existence of the sleeper. It is, with reference to the external world, scarcely superior to that of a vegetable; the mere organic functions continue, but those of relation, as they are called, namely, the senses and muscular motion, are suspended. Whether thought continues, is a point not agreed upon, some considering this function to be likewise suspended; others holding its continuance essential to the existence of the soul, since the latter is unknown to us, except in the various states of sensation and reflection. Those who hold this opinion, must believe therefore, that in sleep the ideas are so faint, or of so uniform a vividness, as to awaken no consciousness (meaning by consciousness that state of the mind in which it refers a past and present feeling to the same individual self); or they must believe that both ideas and consciousness are so faint and indistinct, as not to be remembered. It must have been matter of experience to

* Cels. de Med. iii. 18.

almost every one, that his sleep has often appeared to have been unaccompanied with thought, that is, with dreams, till some time afterwards an accidental feeling or idea will, by some suggestion of resemblance or contrast, or merely from having been co-existent, recall the hitherto unremembered subject of the dream, and occasionally at so remote a period, that having only the remembrance of the feeling or idea, without the circumstances of time and place, he is almost inclined to fancy that his soul had existed in some other form.*

But whether we incline or not to the supposition, that in perfect sleep all thought is extinguished, it is sufficiently evident that our mental connection with the external world is suspended; the nerves of the senses become dull to the usual impressions, no influence of volition is transmitted to the muscles, and that sense which conveys the most numerous and vivid impressions to the mind, and which is perhaps most easily excited, not only shares in the general torpor, but is also provided with the means of mechanical exclusion from the stimulus which acts upon it. The necessity of such an apparatus being appended to the eye, is, that its sensations produce in the mind the strongest recognition of the external world; or, in other words, they are least apt to be intermixed and confounded with the internal ideas. The most common imperfection of sleep is, as we all know, the state of dreaming. The senses may still be as firmly closed to external objects, as in the most complete degree of slumber; the only difference being, that the ideas *are sufficiently vivid to excite consciousness and remembrance*, and, in fact, to produce the same effect on the belief as external sensations. Occasionally, during the continuance of this state, impressions are made upon some of the senses; but as they are not sufficiently vivid to be contrasted with the internal impressions, in consequence of the torpor of the nerves, (and which torpor is perhaps increased by the excitement of the ideas, on the principle that greater action in one part of the system induces corresponding depression in another,) the two classes of impressions are intermixed; they are not observed to proceed from different causes, and the individual is not brought to a conviction of his exact relation to things really external. But not only may the sensation from without fail to arouse the dreamer, from the want of preponderating intensity, it may even assist in the prolongation of his condition; for if it harmonizes with the subject, it will invest it with that feeling of reality which accompanies all perceptions of sense.

* Plat. in Phædon.

Such is sometimes the perverse effect of a sound that was intended to awaken us.

Somnambulism is a still greater deviation from sleep. The latter is so imperfect, that the desire of locomotion and actual exercise of the organs take place, and *sometimes* without any excitation of the senses. But often external impressions and perceptions occur, yet still so deficient in vividness, in consequence either of the dulness of the nerves or of the slightness of the agency, that they present no decided contrast to the internal ideas, and the individual accordingly walks about, avoids obstacles, and sees and touches objects without being awake. Let him be subjected to a strong impression, such as a vivid flash of light, or a sharp blow, or a loud noise, and the equilibrium is at once destroyed, the external world is recognised, and so suddenly, and under circumstances so inconsistent and unusual, that considerable fright is occasioned.

Sleep-talking does not differ in its nature from somnambulism: in both conditions the action of muscles is excited; but in the one the organs are those of locomotion, in the other, those employed in the modulation of sounds.

We now come to the state of Waking. Here the nerves of sense have recovered their excitability, and the impressions produced are therefore so vivid, that the mind distinctly perceives and appreciates the qualities of external objects, at once distinguishing them from the products of memory and imagination, which are now proportionally fainter.

From this condition, however, the individual may again pass into a state somewhat resembling somnambulism; viz., that of *reverie*. His ideas may from certain causes acquire such great intensity, that the sensations, even if they continue as strong as usual, will make less impression, or, in other words, will have less excess of vividness; the result will be, that the person will not be fully aware of the presence of the real external world, and if aroused by a powerful impression, will start as from a state of somnambulism, but with less alarm, because the circumstances are reversed, that is, the time and place are fitting. The starting originates in the perturbation occasioned by all sudden changes in the states of the mind.

We are now brought to another variety in the relation between perceptions and ideas, in many respects analogous to the last mentioned, viz., spectral illusions. It is not necessary, as in reverie, that all the

ideas should be vivified, but some particular visual conception is, by some agent or other, vivified to the height of sensations, and confounded with them. External objects are still recognised, but the image being of equal liveliness is intermixed, and attracts the more attention on account of the novelty and singularity of the circumstances. It is easy to conceive that if the idea should happen to be the image of a deceased individual, a conviction of something supernatural or miraculous is a very probable result. The illusions, however, may assume every variety, from the presentation of indifferent or even pleasing objects, such as plants, animals, faces, known or unknown, to the apparition of the wanderer from the charnel house, the visitation of the dæmons of superstitions, and the angels or monsters of a creative imagination. Nicolai, in the relation of own case, says,

"I generally saw human forms of both sexes, but they usually appeared not to take the smallest notice of each other, moving as in a market place, where all are eager to press through the crowd: at times, however, they seemed to be transacting business with each other. I also saw several times people on horseback, dogs, and birds. All these phantasms appeared to me in their natural size, and as distinct as if alive; exhibiting different shades of carnation in the uncovered parts, as well as in different colours and fashions in their dresses, though the colours seemed somewhat paler than in real nature. None of the figures appeared particularly terrible, comical, or disgusting; most of them being of an indifferent shape, and some having a pleasing appearance."—*Nicholson's Journal*, vol. vi.

The next step in our inquiry is, to consider in what part of the system the renovation of former perceptions takes place. Dr. Ferriar, in his Essay on Apparitions, assumes that the retina is the seat of recollected images, without entering into any argument on the subject. Dr. Hibbert has a chapter upon it, in which he endeavours to shew that the organ of sensation must be the medium by which a past feeling is reproduced: and the first presumption which he offers is, that since an idea is nothing more than a past feeling revived with a degree of intensity proportional to that of the original impression, "the susceptibility (to use his own words) of the mind to sensations and ideas must refer to similar circumstances of corporeal structure." But if we entertain this suspicion, we must extend it to *the whole* of the structure with which the sensation is connected. The Doctor, however, appears to have overlooked this, and makes no mention of the brain and spinal marrow, and those parts of the nerves intermediate to the central system and their extremities, expanded on the external organ. The affection of the trunk of the nerves, and of its attach-

ment in the sensorium, are links in the chain of corporeal occurrences, antecedent to that state of mind in which simple sensation consists, and equally important with that condition of the extremity which follows the application of the external agent: they might easily be proved to be far more important, since the external organ is quite incapable of perception when its connection with the brain is dissolved: but there are pathological facts which shew that sensations are excited independently of the organ (as it is called, though in fact only a part of the apparatus). Thus the pressure of tumors on the olfactory nerves within the cranium has been known to occasion various kinds of smell;—disorder in the brain, whether functional or structural, will cause an individual to hear noises, as in the affection which from this symptom has been named corybantism;—and injury of the spine will produce every variety of feeling, prickling, numbness, heat, coldness, &c. As far, then, as the *a priori* argument is concerned, the organ of sensation, that is, the extremity of the nerves, is the least likely part of the bodily apparatus to be affected, and the brain the *most* likely, because it can excite sensation without the assistance of those prolongations of its substances, which are spread out for the reception of such *occasions* for sensation as are afforded by external objects.

But let us proceed to examine the facts adduced by Dr. Hibbert in support of the position.

The first are the cases of Sir H. Davy and two other gentlemen, who on respiring nitrous oxide, experienced, besides intense mental excitement, several modifications of the sense of touch; the Baronet perceiving a "tangible extension," as he termed it, the others suffering rheumatic pains and feelings of fatigue in various parts of the body.

But there does not appear to me to be any thing in these cases that may not be explained quite as well by saying, that certain sensations were either produced or renewed in the sensorium by the gas which is so strong an agent on the nervous system, and were referred by habit to certain parts of the body with which they, or similar feelings, had been accustomed to be connected; or if it must be supposed that the stimulus of the gas is in some way applied, perhaps through the circulation, to the extremities of the nerves themselves, the impressions on them must be considered in the light of new impressions conveyed to the central organ, and resembling former sensations in those parts; but are not to be treated as mere renovated feelings, without any impressing cause. The same interpretation is applicable to the amusing instances which he relates of

Persons during their dreams, or fits of delirium, or under the delusion of phantasms, imagining themselves to have been the subjects of bodily torture, such as the narratives "that the familiar of one man struck him on the right or left ear, as he did well or ill—that to another individual an angel came with a similar purport,

'And whipped the offending Adam out of him'—

That a third visionary fancied he was scourged on a bed of steel by devils—that a lad was killed by a spirit from a box on the ear," &c.

Dr. H. next brings forward a fact to prove that in the same manner as the nerves of touch are the medium of the production of an idea of touch, so the retina is the seat of a renovated visual image. It is an anecdote of a friend of Nicolai,

Who one night lying awake, with his eyes fixed on the door, fancied that he saw it open, and a tall figure enter the room.

The Doctor argues, that the image of the real door was effaced by the fantastical image of an open door being formed on that part of the retina occupied by the other. Now, to say the least, it was an extraordinary coincidence that the former image of an open door, supposed to have been renovated, should have exactly fitted the space left by the effacement of the recent image of the closed door. But surely it would be quite as natural a supposition that the open door was an impression in the sensorium, which, from its intensity and connection with the apparition, diverted the attention of the individual from the real visible perception. The remaining illustration of Dr. H.'s argument is derived from some observations of Sir David Brewster on ocular spectra. It will perhaps be remembered that some time ago there was a sharp controversy between Sir David and Sir Charles Bell, on the mobility or immobility of ocular spectra; the latter asserting that they are only movable when the position of the eye is altered by its own muscles, in illustration of his doctrine, that our notions of position and motion depend on those voluntary muscular contractions necessary for adjusting the eye to distances; while the former laboured to prove that the spectra do actually move, and that they must do so on optical principles, when the eye is moved by the finger, although the change of position is less perceptible. Dr. H. sides with Sir David; but whichever be right, and we have not time to state the respective reasonings, both the antagonists assert the mobility of the spectra from one cause or other. I do not see, however, that it follows from this that images of visible things must necessarily be reproduced in the external organs; and for this reason: a spectral impression, such as that which is left immediately after the presence of a luminous body,

is surely very different from the mental image of that body recalled under ordinary circumstances. A person fixes his eye on a lamp, and then, having gone into a dark room, sees the spectrum of the lamp exactly equalling in vividness the object recently applied; but after a short time the phenomenon vanishes, and he can only form such an idea of it, as all recollections of sensible impressions are accustomed to produce. The vividness of the image in the former case appears to me to be attributable to the continuation, not a reproduction, of that affection of the retina which results from the application of the body, and which occasions the vividness of the first sensation.

So far then these experiments do not decide the question; but Sir David avers, that under certain conditions of mind, as when abstracted from the influence of visible objects, ideas recalled by the memory or created by the imagination, acquire sufficient vivacity and distinctness to allow them to be subjected to examination, like the spectra left by the impressions of luminous bodies; and that they are found to follow the motions of the eye and head. He mentions it, however, with diffidence, as being the result of his own experience only. A recent writer in the *Quarterly Review (in an article on Dr. Abercrombie's work on the Intellectual Powers) adduces the circumstances as a general observation, without mentioning whether he had himself experienced it. But allowing the accuracy of it, I do not think that we have any thing here upon which to found an opinion as to the seat of impressions renewed *under common circumstances;* for when conceptions have attained so great a liveliness as to be susceptible of the examination referred to, I do not see in what respect they differ from Apparitions or immediate perceptions of sense. They can scarcely be called remembrances, for they do not involve the idea of the past, as is the case with ideas less vivid; nor yet imaginations, because they do not afford the conviction of their unreality or distinctness from the external world immediately present. I am indisposed to believe that sensible images, recalled in the usual operations of memory and imagination, take place in the external organs, from the following considerations. We often think of an absent individual during our employment in something that necessarily occupies outward senses; perhaps while pursuing our way along the crowded streets of a metropolis, we may see, with the mind's eye, our friend on a desolate heath, in the deep stillness of twilight, and listen to his conversation, just as we saw and

* Quarterly Review, July, 1831.

heard him on the evening that we accompanied him in his walk through that scene; yet all this time our eyes are occupied, as we manifest by the care with which we avoid contact with obstacles of various kinds, and our ears are constantly assailed by the din of a thousand cries, and the incessant rumbling of vehicles. Again, while perusing a tale or drama, the scenes and characters described are present to the mind, at the time that the very act of reading proves the eyes to be occupied by the page and letters of the book. We might mention many similar instances incompatible with the notion that conceptions are produced in the organ of sense. There is a fact of a different kind, equally unfavourable to such an opinion. Individuals who have lost the power of seeing, either from paralysis of the optic nerves, or from extirpation of the eyes, are yet capable of conceptions of visual objects. For an example we have only to remember the poet who was the portrayer of the scenery of Paradise, and the sublime apostrophizer of Light; notwithstanding, to use his own words, "so thick a drop serene had quenched his orbs." If then, as appears to me most probable, the organ of sense, or the extremity of the nerve, is not used in the ordinary renewal of perceptions, let us inquire what evidence there is that, *when conceptions become as intense as present perceptions*, this part of the system is made use of. We have just mentioned Sir David Brewster's observations as to the motions of the recalled figures corresponding with those of the eyes and head. An opposite statement is made in a paper published in the first Number of the Journal of the Royal Institution, entitled "Contributions to the Physiology of Vision," and professing to be condensed from some observations by Dr. Purkindje; the statement is—that *mental spectra differ from ocular spectra, inasmuch as they are not moveable.* But Dr. Bostock, in his Physiology, has furnished us with a case, the more valuable and interesting from being his own, and in which, from the long continuance of the phenomena, he had ample opportunities of making observations. He mentions, that when recovering from an attack of ill health, he for three days was constantly in company with spectres, and he expressly states, that they altered their position according to the direction of his eyes. At first sight this fact seemed all but definitive in favour of the view which we are contesting; but on consideration I was disposed to think differently. In the first place it is necessary to bear in recollection, that the mind has a tendency to associate ideas with those of the same degree of vividness: thus, in the first remembrance of an absent

friend, he is surrounded by the places and circumstances in which we formerly saw him; it is only by a difficult effort that we associate his image with the external world, that is, with immediate impressions of sense; and then we at once perceive that he does not belong to them, that there is an incongruity in their union. But if by the action of some morbific cause this image of our friend acquires a certain intensity, it is all but impossible to connect him with the scene and circumstances in which we formerly beheld him, because they are now of unequal vividness; he accordingly takes his station among the objects before our eyes, or, in other words, is projected into the field of vision. Now when we move our eyes, a new field is of course presented to us, but the vivified image is still associated with the visible objects, and the idea of motion is produced in the same complex manner, as when, on observing a distant carriage, we discover that it moves, not by the feeling consequent on a change of place on the retina (for in this instance it is too slight), but by seeing it in connection with new objects in the landscape. But the question immediately occurs, How is the phenomenon to be explained when observed in the dark? Dr. Bostock does not mention whether he examined the mobility of the illusions under this circumstance; but let us take it for granted that he did. The intensified image cannot unite itself to those faint conceptions of objects with which it was formerly connected; and there are no other impressions of equal vividness (in consequence of the absence of light) with which it may join company, and it therefore follows the law of those feelings which are excited by the stimulus of light on the retina, and which do not differ in their nature from it, respectively to the mind, though derived from a different source; in short, it becomes associated (like the sensations of colour, which are, perhaps, the only immediate effects of the application of light) with certain ideas of distance, figure, and position, external to our bodies; and, in fact, excites the same impression on the mind, namely, that of vision. On moving the eye, the image is accompanied with the feeling of motion, simply because, *when looking attentively at objects*, we are accustomed to see them in the direction of the axis of the eyes; this direction being changed by the movement of the organ, the relative situation of the image is also changed, and the idea of motion is the result.

Such are my reasons for thinking that renovated impressions, whether of their ordinary or of excessive intensity, are independent of

the nerves distributed on the external organ, and therefore that Apparitions are not to be referred to affections of the retina. This view is supported by the important fact, that while in the cases of spectral illusions resulting from corporeal disease the brain is evidently the seat of morbid action, there is no proof of the retina being independently affected. The Quarterly Reviewer before alluded to, allows that in the renewal of an impression the sensorium is first affected, but endeavours to maintain the position that the impression is transmitted to the nerve, in other words, that the nerve is likewise affected. That this takes place in ordinary remembrance, certain circumstances which have been mentioned, are, I think, sufficient to disprove; but I do not see any *impossibility* in such a transmission, when the impression is unnaturally vivified; and it appears indeed somewhat probable, from the well-known fact that those parts of the nervous system which have been used to be associated in their action, are ever ready to sympathize; and thus when a certain part of the brain immediately concerned in the recalled impression is, from some cause or other, excited, and which, from its connection, had often been excited at the same time with a spot on the retina, the latter becomes likewise affected. But though we admit the probability of such consenting action, what has been already said, is, I trust, sufficient to shew that the reproduction of the sensation takes place independently of it.

We shall now endeavour to investigate some of the causes to whose agency must be referred that alteration in the due relation between *per*ceptions and *con*ceptions, which occasions an Apparition. Ideas may attain the same intensity as sensible impressions, in the two following states. First, where, either from the condition of the organ of sense, or the deficiency of stimulus to that organ, the sensations are faint, and therefore reduced to a degree of vividness approaching to, or on a par with that of ideas; and Secondly, where the sensations being of the usual intensity, the ideas are, from various causes, unnaturally excited to the same degree; the difference being, that in the one case the sensations are lowered to the ideas, but in the other the ideas are elevated to the sensations. Under the former may be arranged many cases of hallucination, waking-dreams, &c. Thus when a person is half asleep, whether prior to full sleep or on his progress towards waking, that is, when the nerves of sense are torpid, though not wholly insensible to impressions, and surrounding objects

assume a shadowy indistinct outline, it is then that his mental shadows or phantasms are liable to be confused with the former. Every one must have experienced this more or less, while dozing; but if it should happen that one of the mental images was the figure of a deceased individual, his feelings are perturbed, he becomes completely awake in an instant, and the more readily from the slightness of the torpor that oppressed his senses, and he then believes that he has seen a ghost. He perhaps communicates his conviction to some one, and on its being suggested that he must have been troubled with a dream, he asserts the insufficiency of such an explanation, because he remembers that the apparition was present, near the chair or table, or any other article of furniture in the room. Many a ghost story has doubtless been built on such a foundation as this.

> "In sleep, what forms will ductile fancy take,
> And what so common as to dream awake?"—*Crabbe.*

Similar illusions may occur when the person is quite awake; but in these the cause of the faintness of the sensations is not the nerve, but the deficiency of light. Nothing is more common than to hear that ghosts made their appearance at twilight, or by moonlight, or in the thin grey light of approaching dawn. Sir W. Scott makes the White Lady of Avenel describe herself as follows:

> "That which is neither ill nor well,
> That which belongs not to heaven nor to hell;
> A wreath of the mist, a bubble of the stream,
> 'Twixt a waking thought and a sleeping dream;
> A form that men spy,
> With the half-shut eye,
> In the beams of the setting sun am I."

When light is of this feeble kind, and objects* consequently indistinct and vapoury, they are as liable as in the former instances to be confounded with internal conceptions, especially if the mental figures are somewhat more vivid than usual.

* A lady who was under my care some time ago, having been subject to many other nervous derangements, used to complain, that when the shades of evening came on she was tormented with the vision of hideous faces, uncouth figures, and other unpleasant appearances, but they were immediately charmed away by the arrival of a lamp or candle. The light evidently in this case afforded a due superiority of liveliness to external images. Another patient used to tell me that if her rest had been disturbed by a nervous headache, with which she was frequently troubled, as soon as the light of morning stole into her chamber, the figure of a soldier would approach the end of the bed, and remain there till the light became stronger, or till she fell asleep: it gave her no alarm after having been assured of its nature.

There are few who have not occasionally detected themselves idling away a minute or two in tracing faces or figures along the fringe and drapery of curtains, or in the shadows thrown upon the walls of a room lighted only by an expiring fire, or, perhaps, shaping likenesses among the embers themselves. Cowper confesses himself to have been frequently thus employed.—Task, b. iv.

> "Me oft has fancy ludicrous and wild
> Sooth'd with a waking dream of houses, towers,
> Trees, churches, and strange visages, express'd
> In the red cinders, while with poring eye
> I gaz'd, myself creating what I saw."

The facility with which our imagination works upon all these objects depends on the same principle, namely, that the outward images are not strong enough to afford a decided contrast with the shapes evoked by the imagination or memory. It certainly appears to me a striking circumstance that of the various ghost tales which I have either heard or read of, I remember few in which the appearance was related to have occurred in complete darkness. At first sight it might be expected that if apparitions are frequent in twilight, they should be still more so in darkness, because the mental conceptions must possess a still more complete dominion. On consideration, however, it would occur, that in darkness, unless the idea be preternaturally vivified, the mind at once recognizes it as her own creature, because unmingled with any extraneous species. The spectre in darkness and that in broad daylight both require extraordinary liveliness of the image; in the former instance to afford an aspect different from that of the other images derived from the same source as itself; and in the latter to give it an equality of vividness with its external associates.

We have now to consider the agency by which this vivifaction takes place. We have before had occasion to remark that this disproportionate excitation of the ideas indicates disorder of the mind, however temporary; it may now be observed, that this, like all other mental derangements, may be traced both to mental and physical causes, and that it is often a matter of extreme difficulty to separate them, that is, to say that in any given case the cause was exclusively either the one or the other. This depends on our imperfect acquaintance with those alterations in the organization of the brain which may be supposed to induce or accompany the disturbed functions. It might be urged that, since a large class of maladies, called nervous, because consisting of

derangements of those functions of the nervous system more particularly connected with corporeal states, are in the present stage of science as incapable of reference to known alterations in the nervous substance as any of the mental affections; the latter, therefore, have no better grounds for being considered disorders of the immaterial principle independently of the body. This conclusion perhaps loses some of its force when we take into consideration, that the bodily functions of the nervous system can be traced to certain parts of that system with far more precision than the separate intellectual operations, unless we are disposed to assent to the theories of Gall and Spurzheim. But however the case may stand in this view, one thing is sufficiently clear to serve our present purpose, viz., that in many cases of mental disease certain moral agents, whether primary or secondary, stand out as the most prominent antecedents. We may, therefore, say that the causes of the morbid symptom, which is the subject of our inquiry, are sometimes of a moral, at others of a more physical description, remembering that the activity of the former is often much aggravated by the predispositions afforded by the latter. Let us first take a glance at one or two instances in which this mental perversion seems dependent on circumstances derived from the mind itself.

Intense and continued mental contemplation of a particular object may be followed by its apparition.

Sir W. Scott's story of the appearance of a late illustrious poet to his friend was of this description. The latter, after having been engaged in reading for some hours a biography of that distinguished individual with great interest, walked into an adjoining room, lighted feebly by the moonshine, and decorated with suits of armour and fantastic dresses. Among the latter he saw a distinct representation of the poet, but convinced that it was an illusion, he went up to the spot, and the figure vanished.

In this case the mental image was, without doubt, rendered unusually lively by the previous deep attention, but its effect was heightened by a circumstance already treated of; viz., the dimness of the real visual objects in the imperfect light. To the same cause belong the numerous cases of apparitions told of individuals deeply engaged in thinking of departed or absent friends, and those of religious enthusiasts. The former may be illustrated by the interesting account which Baronius gives of the appearance of Ficinus to Michael Mercato.

"Those illustrious friends, after a long discourse on the nature of the soul, had agreed, that whoever of the two should die first, should, if possible, appear to his surviving friend, and inform him of his condition in the other world. A short time afterwards, says Baronius, it happened, that while Michael Mercato the elder was studying philosophy, early in the morning, he suddenly heard the noise of a horse galloping in the street, which stopped at his door, and the voice of his friend Ficinus was heard, exclaiming, 'O Michael! O Michael! those things are true.' Astonished at this address, Mercato rose and looked out of the window, where he saw the back of his friend, dressed in white, galloping off on a white horse. He called after him, and followed him with his eyes till the appearance vanished. Upon inquiry he learned that Ficinus had died at Florence, at the very time when this vision was presented to Mercato, at a considerable distance."—*Ferriar*, page 100.

Narratives of the prodigies seen by fanatic visionaries, both in ancient and modern times, must be familiar to every one; the majority, no doubt, were false; but if any were true, they may be explained by long and strained application to certain subjects. Of the same kind are the million ghost-stories connected with various forms of superstition. Those who wish to collect examples may find an abundant assemblage in Beaumont's World of Spirits, and in Dr. Hibbert's chapter on Spectres referred to superstitious imagery. But the most decided agents in the excitation of certain ideas, are all the various kinds of *perturbation* to which the mind is subject, particularly from the operation of the passions or emotions. I am not sure that the intense mental application just spoken of ought not to be included under this head, since it has a tendency, more or less, to destroy for a time the due equilibrium of the mental system. But to perturbation that ensues from the presence of strong emotions, what myriads of supernatural visitations may be assigned! It will be found, however, on examination, that the painful passions have a much greater tendency than the pleasurable to produce this effect; partly, perhaps, because they appear in other instances, such as in their action on bodily organs, to be endowed with a greater morbific power. It is not often that we hear an authentic account of an individual, under the elating influence of hope, being presented with actual visual embodiments of his airy castles: but there is no limit to the tales of spectral appearances to bereaved and mourning relatives, to the trembling midnight wanderer, to wretches on the brink of ruin, to desolate lovers, and remorse-stricken murderers. In all these cases there is the mind diseased, the order of the thoughts and feelings is broken up, particular ideas have acquired a morbid intensity, and there needs but the impulse of association to introduce at any time a grisly band of ghosts, wraiths,

spirits, and their proper parapharnalia. It would be a useless waste of time to quote on this occasion from the many* instances on record.

While on this part of my subject, I cannot avoid quoting the following lines from one of Crabbe's Tales of the Hall.

"Yet more, in some strong passion's troubled reign,
Or when the fever'd blood inflames the brain,
At once the outward and the inward eye
The real object and the fancied spy;
The eye is open, and the sense is true,
And therefore they the outward object view;
But while the real sense is fix'd on these,
The power within its own creation sees:
And these, when mingled in the mind, create
Those striking visions which our dreamers state;
For knowing that is true that met the sight,
They think the judgment of the fancy right,"

To the vivifying influence of the emotions, we may, I think, trace the phenomenon of the Mirage of the desert. To the parched and fainting pilgrim of the sandy wilderness, no feeling can be more predominant than the desire of drink, and consequently the idea of water is likely to be excited to the liveliness of perception; perhaps, also, it is probable that he sees the phantom-stream in the horizon, because there the objects of vision are fainter, and more capable of being equalled by an excited conception. The vision of towers and pillars, and minarets, apparently imitated by masses of moving sand, may have the same origin, as the spectator in the uninhabited desert must naturally think with intense interest of far-off cities. Mr. Madden, if I remember rightly, is more disposed to consider the phenomenon a spectrum of the mind than an illusion of the eye.

It is unnecessary to remark how strongly outward perceptions are capable of suggesting the morbid ideas. The liveliness of the train of ideas excited by a sensible impression, as in the case of the Swiss peasant, when he hears the song of his native valleys in a foreign

* I may, perhaps, be allowed to mention, that a relation of my own once declared, that at a time of great affliction she was the subject of a spectral illusion. She had lost by death a particular friend, resident in a distant part of the country, and she was walking near a large common, on the evening of the day on which she knew that the funeral must have taken place. It was then that she had a vivid perception of a funeral train slowly moving across the heath; and although she had strength of mind enough to be conscious that it was only a delusion, the appearance was so distinct, that she could not help being much affected by it. Dr. Conolly mentions that once, when in great peril in a storm off the Eddystone Lighthouse, he beheld his family circle as distinctly as any of the objects actually around him.

land, has been attributed by Mr. Stewart to the continued presence and action of the suggesting cause, which is not the case when merely a transient idea calls up its associated ideas, and then takes its leave. Dr. Brown coincides in this explanation, but thinks that we must also take into consideration the conviction of reality which is induced by the perception, and by it diffused as it were over the images of the mind connected with it. With reference to spectral illusions, every one is familiar with the auxiliary influence afforded by particular objects* of sight or sound, such as old ruins, dark glens, churchyards, wild forests, midnight bells, and hollow-sounding winds, &c.

We are often puzzled, however, when tracing the order of phenomena in these anomalous affections, by the want of a link in the chain of associations. The vision often appears to have started up, as it were, isolated from all previous thoughts, and on this account assumes a more supernatural character. Nicolai mentions that he was generally unable to discover any connection between the spectres and the ideas that had prevailed in his mind, before their appearance.

But many circumstances besides Apparitions resist our efforts at explanation in this respect. Thus we cannot pronounce why a person in delirium should remember and speak a language† learned in childhood, but forgotten for many years; we can merely conjecture, that some particular part of the organ of thought is the seat of the morbid excitement. Such cases as these have occurred more than once.

We may, perhaps, remark, *en passant*, that, without impeaching the extent of the gentleman's memory, or the variety of his quotations, it is probable that they were repeated more than once. Still it is not likely that she herself could have recognized them, when reiterated;

* Sir Walter tells a good story of a young man of fortune, who had been troubled while in town with the frequent presence of a set of dancing apparitions, and who was relieved of their company by removing into the country, until some articles of furniture that had been sent down from his London drawing-room brought in their train his old persecutors.

† One still more remarkable may be remembered by some of our readers. It is that of an ignorant female, who, during a paroxysm of delirium, was heard to recite sentences from Greek and Latin authors. This symptom, as may be supposed, was not a little puzzling to the sagacity of her attendants; but after a strict inquiry during the progress of her recovery into her former history, it was discovered that some years before she had been servant to a learned gentleman, who was in the habit of amusing himself by rehearsing in loud tones various passages from his favourite authors in the dead languages. These often fell upon the girl's ears while she was busy in her menial avocations, and it may be imagined could be but little heeded.

her own impression would only be, that they were of the same outlandish sound. No remembrance of particular words had before involuntarily occurred to her, nor had she attempted to recall them by an effort of the will. But if we turn our attention from these extraordinary instances to investigate our most common trains of thought, we shall often be stopped by a similar hiatus. The truth is, perhaps, that there are many feelings either not sufficiently strong to awaken consciousness at the time, or in so slight a degree, that they cannot be recalled, and yet have the power of suggesting other ideas of a more impressive nature. In many cases we cannot account for a series of thoughts in which we have found ourselves involved, until by resuming as much as possible the same circumstances as before, we chance to discover the suggestive agent, or if the cause no longer exists, another person, whose attention was more alive to what was passing around, may intimate an occurrence which gave the impulse to the train. Thus we may suppose, that a senator, while gazing on a romantic valley, finds himself, after a time, engaged in the heat of a debate in Parliament. He is surprised at finding his thoughts thus employed, when but a few minutes before he was enjoying the beauty of the scenery, or fancying the occupations of pastoral life, or perhaps speculating on the geological formations of the surface which his sight traverses; he cannot remember the connection, but on applying to a friend who may be with him, is perhaps told that the latter only recollects having accidentally *coughed*, and which circumstance he will at once, though somewhat painfully, recognise as the medium of association. The same thing frequently happens in reading; the mind is engaged in the matter of the treatise, till some time after a new leaf has been turned, it awakes from a set of ideas widely wandering from the subject in hand, and apparently unconnected; the new page has not been read, and on turning back we remember distinctly having read to the bottom of the page. Unable at present to find the clue to our thoughts, we follow the author, till, coming upon a particular word, we instantly perceive that it was the cause of the diversion of thought; that, in fact, on turning the leaf, and during the momentary interruption of the train of thought occasioned by the action, the word accidentally caught the eye, and suggested the new assemblage of ideas.

Having thus briefly touched upon some of the *moral* excitants of those internal feelings which constitute spectral illusions, let us direct

our attention for a short time to a few of the *corporeal* conditions in which they originate. And first it may be observed, that all these affections are traceable directly or indirectly to the nervous system; from the most extreme excitement of the brain by inflammation or specific irritation, to the various derangements of nervous function. A question naturally occurs here. How should disorder of any part of the nervous system produce that vivifaction of particular ideas in which apparitions consist? The simplest answer, I apprehend, would be, that as we have shewn that those causes which disturb the healthy and well-balanced operations of the mind, may induce extraordinary intensity of certain thoughts and feelings; and as the brain is admitted to be the organ or instrument of thought, any disordered affection of the latter will be tantamount to a direct disturbance of the former: bearing in mind that this organ may be deranged not only by causes working upon itself, but by any morbid action in that system of which it is the centre. If it were desirable to penetrate further into the subject, it might be said that there is good reason for believing (without running into the debateable minutiæ of phrenology,) that certain portions of the brain are devoted to particular purposes in our mental constitution; thus we might say that those bands of fibres connected with, or expanding from the origins of the nerves of the senses, as of sight and hearing, may be devoted, not only to the perception of these sensations, but to their reproduction and new combination by memory and imagination. Morbid excitement in the organ might be directed to these parts either by their particular susceptibility at the time, or the accidental determination of the morbific agents, and the result would be the production of spectral appearances and accompanying sounds. This is of course, in a great degree, hypothetical, and cannot be proved until facts have taught us to identify, with more precision, certain parts of the cerebral mass with particular functions. Such a view, it is evident, keeps quite clear of the errors of materialism; for it will occur to every reflecting mind, that although certain relations between developments of mind on the one hand, and conditions of the cerebral structure on the other, may dispose us to the conviction that it has been the will of the Creator that in our present state of being the immaterial principle should exercise its various energies, at least in union with, if not through the medium of organic phenomena; yet it by no means follows that we thereby involve ourselves in the belief that

this inscrutable principle cannot, at a future time, and with different connections, exert its self-contained powers singly and independently, though the body may have yielded to decomposition, in common with other parts of the physical world.

I may here just mention that the organs, according to the phrenological arrangement which are said by their excitement to produce apparitions, are Form, Colour, and Wonder. Some of the zealous supporters of the system affirm that they have met with cases strongly confirmatory of the theoretical anticipations on this point. Those who are curious on the subject may find several cases of the kind scattered through the numbers of the Phrenological Journal.

Having premised these general observations, we proceed to select for individual consideration a few of the morbid afflictions of the body on which spectral illusions depend.

We shall first take notice of what is commonly called nervous irritability, and which is only a term indicative of a condition of the nervous system, so extremely sensitive as to be susceptible of the slightest impression, and consequently very liable to derangement. It may either be natural to the constitution, or, on the other hand, have been induced by diseases and other accidental circumstances. Volumes might be written on the symptoms of this diathesis; but every one has met with persons suffering from the many and too often unpitied sensations called nervous. They are known to be the lot both of the wretch worn out with care and of the pampered child of fortune; both of the nightly student, and of the luxurious idler; but above all, of hysterical females.*

None of the senses are exempt from the excitement attendant on nervous irritability. All kinds of imaginary sounds† are heard, from the ringing of bells to the distinct intonations of the human voice.

* Burton, in his infinitely amusing Anatomy of Melancholy, says of the latter, in his chapter on maids', nuns', and widows' melancholy, "they will complain, grudge, lament, and not be persuaded but that they are troubled with an evil spirit which is frequent in Germany (saith Rodoricus) amongst the common sort, and to such as are more grievously affected. Some think that they see visions, confer with spirits and devils, they shall surely be damned, are afraid of some treachery, and the like."

† I knew a lady not long ago who scarcely ever fell asleep without seeming to hear strange voices whispering to her ear, and calling to her to go to them. Beaumont has much to say of the awful sounds of tolling bells, and the voices of spirits mingled with them. Aubrey tells of a ghost that disappeared with a most melodious twang.

The olfactory sense* is not allowed to escape.

The derangement of sixth sense, or Cænæsthesia, as the Germans call it, being that of general feeling, are very numerous. Who has not heard of persons feeling too large for their chambers? of little men being unable to get through Temple Bar, except sideways?

"Another thinks himself so little," says Burton, "that he can creep into a mousehole; one fears heaven will fall on his head; a second is a cock; and such a one, Guianerius says, he saw at Padua, that would clap his hands together and crow. Another thinks he is a nightingale, and therefore sings all the night long; another, he is all glass, a pitcher, and will, therefore, let no body come near him, &c.: sed abundè fabularum audivimus."

But none are more numerous than the perversions of visual perceptions, from size magnified, colours altered, and shapes distorted, to all the varieties of Apparitions. There is an interesting narrative in the fourth number of Brewster's Journal, of a lady who was troubled with spectres, and who was the subject of constitutional nervous irritability to a great degree. Her nervous disposition was in fact so extremely sensitive, that she could not hear of a surgical operation having been performed on any individual, such as the amputation of an arm, without suffering acute pain in the same part of her own person.

This is a valuable fact in illustration of the principle which we have so often referred to, that in particular states of the system a remembered or imagined idea may possess the intensity of an actual sensation. It strikes me that this feeling referred to the arm and the vision of an apparition were precisely analogous, each being produced in the mind, and each referred to its respective appropriate situation: the one to external space, in common with all objects of vision; the other, to the individual's person, as a modification of bodily feeling. The case is reported by the lady's husband in the following account:—

"On the 30th of the same month, at about four o'clock p.m., Mrs. —— came down stairs into the drawing-room, which she had quitted a few minutes before, and

* Burton relates that "A melancholy French poet, in Laurentius, being sick of a fever, and troubled with waking, by his physicians was appointed to use unguentum populeum to anoint his temples; but he so distasted the smell of it, that for many years after, all that came near him he imagined to scent of it, and would let no man walk with him, but aloof off, nor wear any new clothes, because he thought still they smelled of it; in all other things, wise and discreet, he would talk sensibly, save only in this."

on entering the room, saw me, as she supposed, standing with my back to the fire. She addressed me, asking how it was I had returned so soon. (I had left the house for a walk half an hour before.) She said I looked fixedly at her with a serious and thoughtful expression of countenance, but did not speak. She supposed I was busied in thought, and sat down in an arm-chair near the fire, and within a couple of feet at most of the figure she still saw standing before her. As, however, the eyes still continued to be fixed upon her, after a few minutes she said, 'Why don't you speak, ——?' The figure, upon this, moved off towards the window at the further end of the room, the eyes still gazing on her, and passed so very close to her in doing so, that she was struck by the circumstance of hearing no steps nor sound, nor feeling her clothes brushed against, nor even any agitation in the air. The figure then retreated to the window, and disappeared."

This lady on a previous occasion had fancied that she heard her husband's voice quite distinctly when he was absent from home. He proceeds to remark:—"Both the stories were so very much *en regle* as ghost stories,—the three calls of the plaintive voice, each one louder than the preceding, the fixed eyes and mournful expression of the phantom, its noiseless step and spirit-like vanishing,—were all so characteristic of the *Wraith*, that I might have been unable to shake off some disagreeable fancies, such as a mind once deeply saturated with the poison of nursery-tales cannot altogether banish, had it not been for a third apparition, at whose visit I myself assisted a few days afterwards, and which I think is the key-stone of the case, rendering it as complete as could be wished." This third apparition was the spectre of a cat.

Hypochondriasis or Melancholia, a malady of the nervous system, though often complicated with disease in other organs, is a prolific source of spiritual creations. Burton's delightful book teems with cases of the kind so richly that selection is a no small difficulty. In one place, speaking of the "adust humour of Melancholy," he says,

"If it be extreme, they think they hear hideous noises, see and talk with black men, and converse familiarly with devils, and such strange chimæras and visions; or that they are possessed by them, that somebody talks to them or within them. Tales melancholici plerumque dæmoniaci. Gentilis Fulgosus writes that he had a melancholy friend that had a black man in the likeness of a soldier still following him wheresoever he was. Laurentius hath many stories of such as have thought themselves bewitched by their enemies, and some that would eat no meat, as being dead. Anno 1550, an advocate of Paris fell into such a melancholy fit, that he believed verily he was dead; he could not be persuaded otherwise, or to eat or to drink, till a kinsman of his, a scholar of Bourges, did eat before him dressed like a corse."

Under the head of Windy Melancholy he says, "Dead men's bones, hobgoblins, ghosts, are ever in their minds, and meet them still in every turn; all the bugbears of the night, and terrors and fairybabes of tombs and graves are before their eyes, and in their thoughts, as to women and children, if they be left alone."

That species of nervous derangement* which is so frequently allotted to men of immoderately studious habits, occasionally gives rise to spectres.

Indigestion, through its influence on the same system, is likewise not unfrequently the origin of ghostly visitations. Every one must be familiar more or less with the effects of a disordered or oppressed stomach† on the imagination in dreams.

Maniacs have afforded to various observers sufficient testimony that ghost-seeing is not the most uncommon feature of their horrible malady. The patient is often discovered making gestures of recognition to persons whom he imagines present, and holding discourse with them of a friendly or hostile nature. Horace describes a delusion of this kind :—

> "Fuit haud ignobilis Argis,
> Qui se credebat miros audire tragædos,
> In vacuo lætus sessor plausorque theatro;
> Cætera qui vitæ servaret omnia recto
> More."

Sir H. Halford quotes this passage in one of his Essays, and informs us that he once saw a person of exalted rank under these very circumstances of delusion, and heard him call upon Mr. Garrick to exert himself in the performance of Hamlet. But it is in that form of the

* Sir Walter Scott's melancholy story of a gentleman high in the law who was constantly persecuted by the presence of a skeleton, may perhaps come under this head. In a recent number of the Phrenological Journal there is recorded the case of a young man who, after having been accustomed to active out-of-door pursuits, suddenly confined himself to severe study, in the arrangement of specimens of natural history, and was soon troubled with a variety of spectral figures.

† Mrs. Radcliffe was so well aware of them, that she is reported to have purposely drawn inspiration from an indigestible supper, when about to portray certain horrific scenes in her blood-curdling romances; while, on the other hand, it is said that Dryden had recourse to raw meat for the suggestion of splendid imagery.

A few years ago a friend of mine, who often suffered from dyspeptic symptoms, mentioned to me that one night awakening suddenly, he saw standing by his bedside two figures, the one an elderly gentleman, whose appearance and dress he described minutely, the other a young man and an intimate acquaintance. To convince himself that he was not dreaming, he turned in bed, and then resumed his former position; the figures were still there: again he tried the experiment, and with the same result. He then lay a considerable time in a state of great agitation, with his eyes averted from the spot, till he fell asleep. In the morning he was so convinced that he had been in the company of disembodied spirits, that he lost no time in sending his servant to inquire for his friend, who happened to belong to the same college. It was no small relief to him to hear that the latter was in the enjoyment of usual health and spirits. On questioning my friend, I found that he had formed one of a supper-party the evening before, and although he had not indulged in strong potations, he had been so rash as to partake heartily of meat, which never failed when taken at so late an hour to produce great inconvenience.

disease commonly called Delirium Tremens, and which is the consequence of excessive indulgence in ardent spirits, that this symptom is most developed : it is, in fact, almost pathognomonic. It is remarkable, however, that the spectres are for the most part the shapes of animals, often vermin and insects, &c., though human ghosts* may likewise form part of the company.

The late Dr. Armstrong, in his paper on Delirium Tremens, in the Edinburgh Medical and Surgical Journal, has related some striking and interesting cases, which I regret I have not room to quote.

Attacks of Fever, which always commence with more or less affection of the nervous functions, are occasionally attended with the symptom† under consideration, even previously to the setting in of the delirium which is so frequent an occurrence in its progress.

* In a case that was under the care of Dr. Ogle and myself in Oxford, I remember that the patient gave scarcely any other indication of disordered mind. One day, when we were standing by his bedside, he remarked (after having answered very coherently a number of questions as to the general state of his health) that a man was standing by the fireplace with a spade in his hand, and wondered what he was about to do the grate. Dr. O. endeavoured in vain for some time to convince him that it was a deception of sight, and at last when the latter yielded as if from politeness, a sort of smile on his countenance seemed to indicate that in secret he considered his doctor somewhat more under a delusion than himself.

I remember another but more anomalous case, in which the disease was not quite so fully developed. In this the vivified ideas of sense were only those of hearing and smell. It occurred last winter. The man had, by way of keeping up a long Christmas, been more or less intoxicated for nearly a fortnight, and it was not surprising that his wits did not escape altogether unimpaired. When I saw him, he spoke very rationally of his bodily symptoms, but made great complaints of sundry plots and machinations that were in progress against his life. On my inquiring by what means he had been informed of them, he assured me that he constantly heard different individuals talking in low tones outside the window, injuring his character, and devising schemes for his destruction, but more especially at night ; and that frequently these people were at the door, and even behind the curtain ; insomuch that he could not sleep for them, but that they were always too cowardly to face him. The poor fellow also refused for a time to take food or medicine, because he was sure it smelled of mercury ; even his snuff he threw away, because it had been poisoned with the same mineral for which he appeared to entertain so unconquerable a disgust.

† A gentleman once mentioned to me in conversation the following instance. He visited a friend one evening who had been rather unwell for a day or two before. He found him very irritable and much excited. After a short time the latter started up, declaring he saw a skeleton moving about the room : he advanced towards the supposed figure, and then exclaimed that it had passed by him into the adjoining sleeping room, into which he followed it. His friend accompanied him, and asked in what part of the room he saw it : the latter pointed to a chair, on which his friend immediately sat down, in order to dispossess the other of the illusion, but in vain. The excitement had now reached its utmost ; for after exclaiming that he saw a skeleton on every chair in the room, he fell down insensible, and was confined to his bed for a considerable time with severe fever.

Phrenitis, or actual inflammation of the brain, as might be expected after what has been already related, afflicts the subject of it with similar impressions; but I have not time to quote from the many examples on record. One of the most remarkable is furnished by Dr. Alderson, in the Edinburgh Medical and Surgical Journal, vol. vi. p. 291.

Shakspeare, aware of this cause, though differently expressed, makes Macbeth address the visionary dagger thus:—

"Art thou but
A dagger of the mind? a false creation
Proceeding from the *heat-oppressed brain?*"

I shall perhaps be excused for stopping a moment to remark that this great expounder of Nature's secrets does not confine himself to any one particular view of these phenomena, as will appear in the two or three following extracts taken almost at random:

In the first scene of Hamlet we have—

"Horatio says, *'tis but our fantasy;*
And will not let belief take hold of him
Touching this dreadful sight twice seen of us."

At the end of the second act Hamlet himself says,

"The spirit that I have seen
May be a devil; and the devil hath power
To assume a pleasing shape; yea, and perhaps
Out of my weakness and my melancholy
(As he is very potent with such spirits)
Abuses me to damn me."

The Queen tries to persuade Hamlet

"This is the very coinage of your brain:
This *bodiless creation ecstasy*
Is very cunning in."

Brutus, on first perceiving the ghost of Cæsar, endeavours to account for it thus:

"I think it is the *weakness of mine eyes*
That shapes this monstrous apparition."

That state of the brain called *Plethora Capitis*, in other words, congestion in its blood-vessels, besides impeding the functions of the organ in other respects, now and then produces the spectral disorder. It appeared to have a great deal to do with the pathology of Nicolai's

case. The following passage describes the relief obtained from blood-letting:

"At last it was agreed that leeches should be again applied to me, as formerly, which was actually done, April 20, 1791, at eleven o'clock in the morning. No person was with me besides the surgeon; but during the operation my chamber was crowded with human phantasms of all descriptions. This continued uninterruptedly till about half an hour after four o'clock, just when my digestion commenced. I then perceived that they began to move more slowly. Soon after, their colour began to fade, and at seven o'clock they were entirely white. But they moved very little, though the forms were as distinct as before, growing however by degrees more obscure, yet not fewer in number, as had generally been the case. The phantoms did not withdraw, nor did they vanish, which previous to that time had frequently happened. They now seemed to dissolve in the air, while fragments of some of them continued visible a considerable time. About eight o'clock the room was entirely cleared of my fantastic visitors."

Dr. Gregory's case of a gentleman who was knocked off his chair every day by the crutch of a phantom witch soon after dinner, is of this description. The individual had a tendency to apoplexy, and got rid of the witch by the sacrifice of some blood.

An opposite condition, however, may be the occasion of similar occurrences. I mean when there is a deficiency of the circulating fluid: the organ in this latter case, instead of being oppressed by the excess of the stimulus, fails to perform its functions rightly for want of a sufficiency of it. It is not at all uncommon for persons who have lost large quantities of blood by accidents or for the removal of inflammations, to be distressed with the presence of all kinds of odd faces and figures.

Many other specimens of bodily disorder might be mentioned as associated with the complaint under discussion. Persons who have been deprived of their rest many nights in succession are liable to it.

"Qui multùm jejunant, aut noctes ducunt insomnes," saith Burton: "they that much fast or want sleep, as melancholy or sick men commonly do, see visions; or such as are weak-sighted, very timorous by nature, mad, distracted, or earnestly sick."

In short, this symptom may appear in any disorder which disturbs the nervous system; or it may even appear alone, just as an anomalous spasm, or convulsion, or tremor, or disordered sensation may occur without any other indication of disease. Certain poisons of the Narcotic class sometimes induce the symptom. Hyoscyamus and Belladonna in particular have been said to have this effect. That

Opium has a similar tendency must be strongly impressed upon all who remember the powerfully described visions in Mr. de Quincy's Confessions of an Opium Eater. The animal poison that causes Hydrophobia is said to have induced, besides the other awful excitements of the nervous system, this additional horror—the phantom of the rabid dog!

Lastly, we may notice that spectral impressions not unfrequently in the last stage of any disorder accompany those symptoms which are the precursors of death. Sometimes the moribund patient is only observed to dart his hands before him, as if endeavouring to grasp at shadows that float in the air; at other times his eyes are fixed on vacancy, while he is heard to mutter feebly as if in conversation with the imaginary objects.

"Talking all idly unto shapes of air."

Some fancy their absent friends, or people whom they knew in by-gone days, are come to bid them farewell, while others again believe that the spirits of the departed are gathered round to welcome their approach to another world. Some, not by nature eloquent, have described in glowing language the scenery of Elysian meadows and shady dells, through which they imagine their delighted spirits to be already wandering; and it will be remembered that Dame Quickly, in her exquisite picture of poor Falstaff *in articulo*, says,

"For after I saw him fumble with the sheets, and play with flowers, and smile upon his fingers' ends, I knew that there was but one way; for his nose was as sharp as a pen, an *'a babbled of green fields.*"

In some cases the excitement of the imagination rises to such a height, that the eyes of the dying man are lighted with a strange brilliancy, and his whole countenance expresses ecstatic rapture, while heaven and its glories seem bursting upon him. Queen Katherine, in her last hours, is made to exclaim:

"Saw ye not, even now, a blessed troop
Invite me to a banquet; whose bright faces
Cast thousand beams upon me like the sun?
They promised me eternal happiness;
And brought me garlands, Griffiths, which I feel
I am not worthy yet to wear."

Sometimes the case is fearfully reversed, and the individual is seen convulsed, shuddering and shrinking from the fancied presence of all

hell and its demons. In all these cases it is evident that the ideas which attain such an unnatural degree of intensity, may take their colour more or less from the circumstances and trains of thought to which the mind of the individual had been before habituated.

I should not have completed my task were I to conclude without noticing a description of stories, which are frequent, well-authenticated, and calculated to impress the belief in favour of the reality of Apparitions. I allude to those cases in which a remarkable event occurs exactly corresponding either with the supposed supernatural appearance, or with the revelation communicated by the vision. It has often been urged that these verifications of ghosts by warnings are far too numerous to be explained away on the ground of mere coincidence in time and place, and that whether the ghost was a *bonâ fide* ghost or not, it must have taken its origin from something more than accidental occurrence in the mind of the spectator, since it was followed by an event which exactly tallied with the spectre's communication, and which could not have been anticipated by human foresight. Thus it is said that the thousands of instances that have occurred of the sudden appearance and departure of an individual known to be separated by wide distances of sea and land, and an hour, nay, a moment afterwards found to agree exactly with the time at which that individual expired, the appearance being made to those most interested in the event, cannot be satisfactorily interpreted as fortuitous. It was on facts of this kind that Dr. Johnson partly rested his well-known opinions in reference to this subject.

It is difficult to attempt to come to any positive conclusion on the point, from the unwillingness that we entertain, on the one hand, to set aside such remarkable facts, and on the other, to admit too easily the frequent interference of supernatural agency. The following, however, appear to my humble conception to be the safest conclusions:—1st. That no Apparitions whatever have any existence exterior to the minds of the individuals who see them, being merely ideas in an unnatural degree of excitement. 2ndly. That by far the greatest proportion of spectral appearances originate in certain *accidental* states of the mind or body of the person visited; but, 3rdly, that it is possible that in a very limited number of cases the Deity may be supposed to have been the primary agent by condescending for some particular purpose to vivify the idea in question. With this view we are saved from allowing that *miraculous* interposition takes

place on these occasions. To say the least, it is easy to conceive that the Deity may, by the fiat of his will, produce that change in the relative intensity of a man's mental impressions which at another time some comparatively trifling occurrence in the mental or corporeal system might have power to effect; but no phenomenon displayed in the human mind, however striking or uncommon, could strictly be designated a miracle, since the term implies a deviation from fixed and well-ascertained laws, such in fact as we are at present unacquainted with in the moral world. But though supernatural interposition is easily conceivable, the admission of it in particular instances requires the utmost caution. To convince ourselves of the danger of this subject, we have only to turn to the example of Lord Herbert of Cherbury, who persuaded himself that he had received a supernatural intimation that a work which he had just finished, and which attacked the principles of Revealed Religion, was pleasing in the sight of the Almighty. One of the most touching stories of the class which I have just alluded to is the following. It is contained in Beaumont's World of Spirits:

"Sir Charles Lee, by his first lady, had only one daughter, of which she died in child-birth; and when she was dead, her sister, the Lady Everard, desired to have the education of the child, and she was by her very well educated till she was marriageable; and a match was concluded for her with Sir William Perkins, but was then prevented in an extraordinary manner. Upon a Thursday night, she, thinking she saw a light in her chamber after she was in bed, knocked for her maid, who presently came to her, and she asked 'why she left a candle burning in her chamber?' The maid said she 'left none, and there was none but what she had brought with her at that time;' then she said it was the fire, but that her maid told her was quite out, and said she believed it was only a dream; whereupon she said it might be so, and composed herself again to sleep. But about two of the clock she was awakened again, and saw the apparition of a little woman between her curtain and her pillow, who told her she was her mother, that she was happy, and that by twelve o'clock that day she would be with her. Whereupon she knocked again for her maid, called for her clothes, and when she was dressed, went into her closet, and came not out again till nine; and then brought out with her a letter sealed to her father, brought it to her aunt the Lady Everard, told her what had happened, and declared that as soon as she was dead it might be sent to him. The Lady thought she was suddenly fallen mad, and therefore sent presently away to Chelmsford for a physician and surgeon, who both came immediately; but the physician could discern no indication of what the Lady imagined, or of any indisposition of her body; notwithstanding, the Lady would needs have her let blood, which was done accordingly. And when the young woman had patiently let them do what they would with her, she desired that the chaplain might be called to read prayers; and when prayers were ended, she took her guitar and psalm-book, and sat down upon a

chair without arms, and played and sung so melodiously and admirably, that her music master, who was then there, admired at it. And near the stroke of twelve, she rose and sate herself down in a great chair with arms; and presently, fetching a strong breathing or two, immediately expired, and was so suddenly cold as was much wondered at by the physician and surgeon. She died at Waltham in Essex, three miles from Chelmsford; and the letter was sent to Sir Charles at his house in Warwickshire; but he was so afflicted at the death of his daughter, that he came not until she was buried; but when he came, he caused her to be taken up, and to be buried with her mother at Edmonton, as she desired in her letter."

I shall offer no other comment on the narrative than this: If a supernatural intimation was really intended to be given through the medium of the strong mental excitement, the fated lady certainly assisted the fulfilment of the warning by the effect which such powerful presentiments in other cases effect on the bodily system; but if it was only an accidental illusion, we might say, without having recourse to fortuitous coincidence of disorder and death, that cases have occurred in which so powerful an impression on the imagination has been alone sufficient to do the work of a fatal malady. Dr. Hibbert, in remarking on the story, throws out a hint that there was more disease than the doctors of that day had sagacity to discover. Such an impeachment of the practitioners whose assistance was called in, albeit they were of the olden time, appears to me unnecessary.

It is high time to draw these remarks to a close. Liable as we are to derangements in the due relations of our ideas to each other from the various causes that have been mentioned, there is little probability that spectres will ever be *entirely* banished from our world. Even if all external exciting causes shall in time be removed; if the feudal castle and its haunted dungeons, if the old mansion, with its mysterious chambers, its winding staircases, and tapestried galleries, if the mouldering convent and its storied vaults shall be swept utterly away, and not even a legend of them be remembered; if the wild heath, where the spirits of murdered men were accustomed to wander restless and comfortless, should be so entirely overspread with the abodes of the living as to leave no room for the nightly walks of the dead; if tradition shall have forgotten to point out the wizard's cave, where unearthly visitants came thick at the call of unhallowed knowledge; and finally, if churchyards, the more especial domain of phantoms, shall in time give place to pyramids, and cemeteries of modern device, where no footing will be allotted to ghostly steps; if indeed time shall efface all these outward agents, there will yet be enough in human

minds to give some life and vigour to these visionary creatures, be their local habitation where it may: trifles light as air may overturn the equilibrium of ideas, the passions will ever be ready to perturb and disconcert, and the delicate organization of the nervous system will be as liable to derangements. The most that can be expected from time will be an increase of information among the various classes of mankind sufficient to enable them to consider and analyse their mental operations, to separate true from false impressions; in short, to do that which to an uneducated mind is the most difficult of all tasks, namely, to give more credence to the inductions of reason than to the supposed evidence of the senses. Whether it be *desirable* that the belief in Apparitions, as one of the ties that bind the thoughts of men to the invisible world, should be done away with among the mass of mankind, might perhaps afford matter for debate: it is a question, however, quite foreign to my province, and at all events one that, incompetent as I feel to enter upon it, I leave to better judges.

ON THE RELATIONS BETWEEN

MIND AND MUSCLE.

MUSCLES* and their contractions have commonly been divided into voluntary and involuntary; a distinction which involves many anomalies, and may lead, and indeed has led to considerable confusion. The muscles which are employed in the mere organic functions, have been placed in the latter class, while those which subserve locomotion have been grouped in the former. But it is well known that certain motions which are for the most part independent of the will, have in some instances been subjected to its control, and on the other hand, that in a great number of those which are designated voluntary, volition has very little concern, and that every one of them might, under certain conditions of the system, be brought into play in direct opposition to that principle; so that the most that can be said for this classification is, that it is based on the general fact, that the one group act nearly always without any stimulus from the will, while the others own this faculty, if faculty it be, as a very frequent instigator to action.

An arrangement less subject to exception, and adopted by many physiologists, is that which distributes muscular motions into those which maintain the nutritive or vegetative life of the system, and those which enable it to entertain relations with surrounding objects. On the latter, principally, it is my intention to offer the following remarks, in which I shall restrict myself to the consideration of the connection between the movements in question, and certain mental phenomena.

* Read before the Philosophical and Literary Society of Bristol, December, 1834, and reprinted from the *West of England Journal*.—Ed.

The first inquiry that presents itself is, what is voluntary motion? If we apply to etymology, we shall only make out that it is motion related with desire, wish, inclination, preference, &c. But as the word *voluntary* has acquired a signification of more import than its root, we must not content ourselves with its derivation. When a person has desired an object, and gained possession of it by means of certain muscular contractions, he is said to have executed a voluntary movement. But what was the process? Let us suppose that the object was a book upon the table before him. After questioning his consciousness, he can enumerate no other events than the wish to take up the book, the belief that the action will ensue, and the movements of his hand and arm, which accomplished his wish and confirmed his expectation. This, however, may be considered so customary and mechanical an action, as scarcely to present a fair example for educing the operation of volition. Let us choose then a movement entirely new to the individual. He wishes to pass a sword between two powerful magnets, which are in rather close proximity to each other; he executes this difficult manœuvre; and we ask, what have been the events in the process? He wished to hold the instrument fast, and his hand grasped the hilt; he wished to move it forward, and his arm was projected; he wished to move it in a line midway between the magnets, knowing that in that direction their mutual antagonism would assist him in overcoming the attraction of either one; he felt on a deviation from this line a strong attraction, and he wished to move the weapon in an opposite direction, but not so far as to encounter a similar difficulty on the opposite side. His wishes were accomplished; and he can give no additional information, if he merely scrutinizes his own consciousness.

But this instance again may be objected to, on the ground that although the general resultant action is new, yet the elementary movements are so familiar, as not to have required the occurrence of volition. To select then an example entirely free from any exception of this kind; let us suppose that the individual wishes to bend his arm; the flexion is effected; and again we enquire, what were the events in the process? It cannot now be said that the action was not attended to, in consequence of the mind being occupied with the ulterior object. The motion of the limb was desired, and the motion took place; this is all that can be learned from the agent. But it is the opinion of many philosophers that there was an intermediate event,

to wit, volition. They hold that *to will* and *to wish*, imply separate states of mind; and they describe volition as a mental attempt anterior to muscular motion, and subsequent to, and determined by, desire. In other words, the agent first wishes, then wills, and then acts. By what arguments is this view supported?

In the judgment of some persons, it may perhaps derive no little force from the notion, that the will is something active and spontaneous, while desire is altogether passive, and must consequently be a separate mental condition. Now the idea of activity is said to have two sources; the one consisting in our observation of certain bodies which move without apparently being operated upon by other bodies; the other consisting in the fact that we are unconscious of any external event that stands in the relation of cause to our own movements, or in other words, in our belief that these movements are self-impelled. In each of these cases, the notion of activity results from the non-appearance of any prior event; in each we take a limited series of events, the first of which is viewed with reference to those only that follow, and not to any preceding series. But surely the same notion of activity arises in minds, whenever we view any limited set of phenomena whatever; (for with our imperfect faculties we are unable to survey the whole series up to the great First Cause.) Each detached series has, by virtue of its detached circumstances, an initial event, which is active with relation to all the events that follow it. Thus we say that an acid *acts on* a metal; the acid is viewed only in its relation of antecedence, and has active character; but how came the acid in contact with the metal? It is now considered with reference to a series of phenomena that have gone before, and immediately assumes a passive aspect. The same holds good with every event that we know of; it is active as an antecedent, passive as a consequent. It is easy then to understand why desire is generally considered as a passive emotion; it is because this feeling is contemplated in a series of events of which it is the conclusion; the series being, the presentation of the object, the perception of the object, and the desire of the object. Volition, on the contrary, obtains its active character from being viewed in relation to certain movements which succeed it. But is it not possible to make these two conditions (supposing them not to be identical) exchange characters? Unquestionably; and simply by considering them in relation to each other; for desire has then the priority of occurrence, and consequently is active, while volition is necessarily passive.

There does not appear then sufficient reason for denying the identity of volition and desire, on the ground that the one has an active and the other a passive quality. Let us endeavour to try the value of another argument.

There must certainly be an operation intermediate to desire and action, it is urged, or to what can be attributed the *feeling of effort?* for surely this is something different both from the wish, and from the action which is the object of the wish. This is a proposition which requires a very close scrutiny; for if there really be a feeling of effort, *sui generis*, incapable of resolution into desire of action, the question is at an end; the feeling is the tertium quid, the very volition whose existence we are discussing. In order that we may better understand in what an effort consists, it will be convenient to take one or two illustrations. A man wishes to snap a piece of cord by which his hands are tied; we see him separate them suddenly, and the band is broken. In describing the action, and the mental condition which preceded it, we should merely say that the man wished to break the cord, and that he broke it. But if the first motion of the hands is not followed by the rupture, we then say that he made an effort to that effect; but in what respect do the two cases differ? The wish was the same, and the muscular motion the same; in the one case these events were followed by the desired event, in the other they were not. To this it may perhaps be answered, there is in reality an effort, no less in the former than in the latter instance, since it occurs before the muscular action, and consequently is not dependent on the fulfilment or on the non-fulfilment of the ulterior object, and that it is only in common parlance that the use of the word effort is confined to the unsuccessful series of events, it being lost sight of in the other instance, or confounded with the action itself. To avoid then any confusion of this kind, let us view the individual in the act of straining the cord. Had we never seen a person so employed before, and were we ignorant of the effects of tension on such a substance, we should merely say that he was forcibly pulling the cord in opposite directions; but if we once get into our minds an idea of his ulterior wish, we declare that he is making an effort. Here again the word is used with reference to something which is to be subsequent to the muscular action, not to any thing that has preceded it.

Let us take another example, and the strongest that can be found in favour of the doctrine of effort and volition. Such an one, I think,

will be met with in the case of a person, who having a recently-paralysed limb, is desirous of moving it in the customary manner. It remains motionless; but the individual is said to make an effort, though a useless one, to exert his volition, though in vain. "Is it to be imagined," says a spectator, "that the mental state of the individual is nothing more than an emotion of desire, when I witness his earnest look, his compressed lips, his close-set teeth, his distended nostril, his flushed cheek, and his starting eye?" "Did I experience no other mental affection than a wish?" asks the sufferer himself, when he sinks back on his pillow, exhausted by his futile exertions. To the former it may be replied, that the phenomena which he has enumerated, and considered indicative of a peculiar state of mind, distinct from desire, are the results of instinctive actions which accompany the intense desire of any particular movement; that they nearly all belong to a set of respiratory muscles, which are employed in preventing the egress of air from the chest, a condition essential to all difficult motions; and that the actions in question may be singly or collectively designated an effort; but he must bear in mind that in themselves they involve no affection of consciousness. The question of the paralytic himself may be met by the request that he will describe his own feelings; for in doing this he can enumerate nothing that is not resolvable into the desire of the movement, and the consciousness of the occurrence of certain respiratory actions, which he has often experienced prior to, or concomitant with, the desired action, and which he therefore denominates efforts. Or tell him to use these respiratory muscles in a similar manner, but without reference to any ulterior action, and then enquire what he has felt. He will be unable to do more than enumerate the wish that arose, at the suggestion, for those muscular actions, and their consequent occurrence; for he is precisely in the same predicament, as the individual of a former instance, who desires or wills the flexion of his arm.

In all these instances, analyse them as carefully as we will, we fail to discover the slightest evidence of any separate mental condition, corresponding to what is designated an effort. However real and palpable the notion may at first sight appear, when pursued it is found to be a phantom, and there is nothing to grasp but the desire and the movement *between which* the fugitive shape had hovered.

An examination of the word *effort*, or its synonymes, *attempt*, *endeavour*, &c., in their metaphorical applications will lead to a similar

result. An effort, whether in the organic or in the inorganic world, will always be found to express the relation of an event to a series of which it *is*, or *has been* formerly experienced to be, initial or antecedent. The chemist having discovered at the bottom of his crucible an amorphous matter, which he remembers in former experiments to have been the commencement of a number of changes which terminated in the formation of crystals, declares that there has been an *attempt* at crystallization. The anatomist, when a mal-formed organ is submitted to him, knowing that the animal, to which the organ belongs, traverses in its embryonic development a series of organic forms permanent in the lower tribes, scarce hesitates to say, that nature has made her usual *efforts* to form a more complex organization, but that they have failed; or the zoologist, if he be as loose a reasoner as Lamarck, may pronounce all the interior species to be so many *attempts* at the production of more perfect ones, like the imperfect crystallizations of the chemist. The pathologist having observed certain phenomena in the course of a fatal disease, may assert that they were the *endeavours* of nature to effect a cure, because on former occasions he has noticed such events to have been followed by a series of others, which ended in recovery. But not to multiply examples, we may conclude by remarking, that in all of them the word effort is applied to an event or to events which bear the same relation to other events, as the desire of certain actions, to the occurrence of those actions.

Our inquiry into the nature of activity and effort, having failed to produce any evidence of the separateness of desire and volition, let us examine another kind of proof.

Mr. Locke observes, that "Desire may have a contrary tendency to that which our will sets us upon." Dr. Reid takes the same position; and recently it has been maintained with great earnestness by Dr. Chalmers, in his Bridgwater Treatise. From the illustrations adduced by these authors, it appears to be their opinion, that those muscular movements which take place to achieve objects that are disagreeable to us, cannot be the products of desire. But in order that we may desire a thing, is it necessary that this should be of an agreeable nature? When two events or actions, each productive of pain, are presented to our consideration, does not that which is less painful immediately become an object of our desire? Do we we not daily observe that persons eagerly long for the infliction of certain surgical operations, in order that they may avoid the continuance of severer

suffering? The nauseous draught of medicine, which, according to Dr. Chalmers, is taken by virtue of an act of volition in opposition to desire, appears to us to be itself an object of desire, because viewed as the means of preventing or removing indisposition. The cases brought forward by Dr. Reid, as exemplifications of an opposition between will and desire, have been fully analysed by Dr. Brown, in his Treatise on Cause and Effect, and proved to shew nothing but the opposition of one desire to another, and the determination of the action by the predominating desire. The work just mentioned renders it needless for us to dwell longer upon the argument in question, and we shall therefore content ourselves with a remark upon the common phrase, "to act against the will." Will is here employed in the sense of desire; this must be allowed by even the most sturdy asserters of the separateness of will and desire. But as the *act* implies a volition, or effort of the *will proper*, they must say that an individual may will an act against his will. To our apprehension it would be equally correct to say, that he desires an act against his desire; in other words, that one desire is opposed to, and predominant over the other. When, therefore, we talk of acting against the will, we omit the mention of the desire which determined the volition, and only intimate the opposition of the action itself to the first of the two desires. The following example will perhaps exhibit this point in its true light. A school-boy is aroused from his slumbers, and his happy dreams of hounds and horses, by the dissonant clang of the matin bell. The first desire that arises in his mind is to renew his repose, and the pursuit of his pleasing illusions; a second emotion arises in the form of a desire to avoid some discipline, or to obtain a prize for diligence and punctuality. If the first be the stronger, he sinks back upon his pillow; if the latter, he leaves his bed, and he says, "against his will," in which phrase he specifies the vanquished desire, and leaves the other to be inferred from the action which it has determined. The continuance or return of the resisted motion does not argue against this view; it is still a weaker emotion, notwithstanding the subject of it may say that he would have much preferred remaining in bed; for by this he only means, that continuing in bed would have been more agreeable than his present condition, while he neglects to mention the ulterior object, the contemplation of which was the cause of his being where he is.

Another objection to the identity of desire and volition, is founded upon the assertion that the latter is conversant with our own acts only,

while the objects of the former are external to us. But this we consider to be weaker ground than even either of the former positions. It is true that as the words are used, we may desire the actions of a foreign body, but can only *will* our own; and if we set out with the assumption that volition and desire are different faculties, this would appear a very natural character of distinction. But the nature of the object does not alter the mental condition. Whether a red rose or a white rose be presented to the eye, the mental state is still a vision; and in like manner, whether a person wishes a cloud to pass before the sun, or the motion of one of his limbs, the mental state is in either case, *desire*. But if this be true, how is it, some one may ask, that we give this particular instance of desire a specific designation, viz. will or volition, while all the other species possess only their generic name? We apprehend the reason to be simply this; that in the former instance, *the desire bears the relation of cause to the subsequent action, while in the latter there is no such relation*. The muscular movement takes place, *because it was desired;* our experience of the invariable sequence of these two events, induces us to describe them as cause and effect; but the passage of the cloud over the sun, if it chanced to follow our desire, we know full well was not the effect of the latter, because our experience has often recognized the occurrence of these events without a similar chain of sequence.

Let us glance at one more objection contained in such a question as the following:—"How are we to explain the case of a person who desires to move his limb, but being convinced of the impossibility of the action, does not choose to exert his volition?" In this query there is in the first place an assumption than a person *can* desire what he believes to be impossible; and secondly, it is overlooked that the desire of the movement must necessarily induce, as we have shewn above, those initial or preparatory actions which constitute an *attempt*, or volitional exertion. Can we entertain a desire, though believing in the impossibility of gratifying? Certainly not. To desire an object, and to feel that it would be very agreeable, if possessed, are two very different states of mind. "I should like so and so," has a very different signification from "I wish or desire so and so." The former expression might be used by a sensible person with reference to any thing physically impossible, such as a visit to the Dog-star; but the latter applied to the same object would indicate unsoundness of mind. The difficulty in relinquishing what is called a useless desire, depends

on the difficulty of believing that it is useless. A mind unhinged by the wrench of a dreadful bereavement may long for the return of the dead, but it is because that mind is incapable of considering the circumstances which render the object of its desire impossible. A child both wishes and asks for many impracticable delights, and the most effectual method of stopping such desires is to convince him that they cannot be realized. A culprit may be anxious for the release of his limbs from the stocks, but has no desire to remove them himself, because he believes the action to be impossible; he consequently makes no *efforts* at extrication so long as he entertains this belief, which efforts, however, would occur by necessity, if he experienced any desire. To return to the case more immediately before us; if the paralytic can be convinced that it is possible for him to move his limbs, the corresponding desire immediately arises, and is followed either by the movement in question, or by those respiratory actions which constitute an effort.

Thus far then in our inquiry we have been unable to discover any event intermediate to the desire, and the occurrence of the muscular movement which is its object. It has been seen, however, that the former stands in the relation of cause to the latter; which cannot be predicated of it in connection with any other object. Volition then, or will, if we understand it rightly, is an expression of this relation; in other words, *to will*, in its strict sense, is to wish a muscular action. It is in its character of *cause*, that the word *will* is almost always applied to the desires of the Deity; because it is obviously impossible to conceive of any condition of the Divine mind, which is not necessarily followed by the event which is its object. In like manner, the inclination of a monarch in the affairs of his kingdom, is often designated as his will, because the desired effect nearly always follows. So again the wish of an individual with regard to the disposal of his property, being rendered more or less certain of execution by the law of the land, is termed his will. When we say that our desires have been gratified without the intervention of our will, we only express circuitously that the occurrence of the desired event was not the *effect* of the desire.

Before quitting this part of the subject, it may be remarked, that volition is often supposed to be exercised in choice or preference; but we trust there is no need to point out that this is an improper application of a term which belongs only to muscular action and its cause in

the mind; choice, as we shall see presently, being nothing more than the strongest of two or more desires, and having no necessary connection with action. *Intention, resolution, determination*, &c., are only forms of the same mental condition, the choice of some action or line of conduct, that may appear more desirable than some other presented to our contemplation. Is there no difference then between these phrases, "I wish to study Geology," and "I intend, or have resolved, or have determined, to study Geology?" Unquestionably. In the former instance I express a wish, but by no means intimate that it exceeds my inclination to stay at home, and attend to pursuits that demand less corporeal exertion. In the latter, I declare that my inclination to the study predominates over any opposing desire.*

In considering the nature of resolution, we must be careful not to confound it with volition, which so often occurs, though not necessarily, between the resolution and its achievement. Our resolves are executed more or less by muscular actions of some kind or other, whether by speaking, writing, locomotion, &c. Volition we have said is the desire, whose object and result is muscular movement; but as the latter may have other causes, volition is not necessarily implied in the execution of a desire. Thus I may resolve and announce that I will fetch something from an adjoining room, and may execute my intention and prophecy, without the occurrence of a single volition; for my muscles may have acted without my consciousness, and consequently without my desire. But this point will be discussed more at large, when we speak of the different motions and their causes.

The origination of desire is a complicated subject,† but it will serve

* The auxiliary "I will" intimates both wish and resolution, and in addition, perhaps, a decided expectation of the future event.—"*I shall*," expresses little more than a prediction; at all events it is improperly used if made to express inclination, since *shall* is derived from a Saxon word, signifying "ought," and therefore implies the operation of some agent prior to the agent spoken of, or in other words is *passive*. This will appear more evident, if we choose another pronoun. If I say, that "*he* will study Geology," I predict his occupation, and only trace its causation as far back as his own mind. "He shall study" &c., at once declares that the beginning of that series of events which ends in his geological occupation, is something external or prior to his own feelings on the matter."

† It is almost superfluous to observe, that the view which has been taken of volition, as a relation of cause and effect between desire and muscular motion, is in perfect accordance with the free agency of man; since if we act in consequence of desire, we act as freely as possible, that is, precisely as we like. How we like, and how we desire in all cases, are questions of difficult solution; but one thing is certain, that motives of the greatest cogency have been provided by our Creator and Moral Governor, both in the dictates of conscience and in the precepts of revelation.

our present purpose sufficiently to state, that this emotion may arise in two ways; first, it may be the immediate consequent of a simple bodily feeling, of an external sensation, or of a conception; secondly, it may be the result of a comparison of two objects, or a judgment. In the former case it is instinctive; in the latter, it has been termed choice or preference. Instinct is manifested, not only in the properties which urge the lower animals to some of their most important functions, but also in human appetites, and in those vehement wishes which suddenly start up, particularly in the minds of children, on the perception or remembrance of any pleasing object. No period of existence after birth is too early for the development of this form of desire. Witness the chicken catching at a fly while in the act of breaking from its shell, and the young infant stretching forth its hand towards some glittering object. What may be the nature of those desires which induce the lower animals to place substances in a particular mechanical arrangement, as in the construction of a nest, a honey-comb, the winter-quarters of the beaver, or the web of the spider, it is vain to conjecture.

Choice is more capable of analysis than instinct. The remembrance of former experiences, the resemblances of events, the expectation of like effects from like causes, the balancing of probabilities, all participate in the production of that state of mind in which one of two objects appears more pleasing or less painful. But this kind of desire is by no means confined to the human species. A cat may feel an instinctive longing for a bird in a cage, but remembering that the execution of her desires on a former occasion was accompanied with an injury to her claws, which produced pain in a greater degree than the feast on the victim produced pleasure, remains quiescent.

The accomplishment of desires, which ever be their class, is effected by muscular motions; and these are hastily called voluntary, for no other reason than that they are concurrent with or not opposed to desire, without its being duly considered whether they result from intermediate desires, of which they are the sole objects. Out of the infinite number of muscular contractions which we daily and hourly exercise, how few are voluntary in the strict sense!* Nor is it very easy to separate the latter from those which derive their character of voluntariness from the mere circumstance that they are not inconsistent with, or might be suspended by our will or desire. Perhaps the readiest mode of ascertaining them may be to select those which certainly do

* It might perhaps obviate confusion, to characterize such motions as *volitional*.

take place, without any *efficient* desire, and thus to arrive at the others by what our neighbours call "la voie d'exclusion."

It may seem at first sight, with reference both to what has been already advanced, and to what remains to be said, that the *nervous* connections of muscles have been overlooked; but a little reflection will shew that our remarks upon the action of muscles apply equally to the nerves which excite those organs. A change in the nerve supplying a muscle, must undoubtedly take place before the latter can act in obedience to the stimulus of desire, or of any other of the causes to be mentioned hereafter. When we speak of muscular contraction as following immediately upon desire, we by no means wish to intimate that the muscle contracts without a prior affection of the nerves, and indeed of that part of the central nervous organ with which they are connected;—we mean only that desire is the last state of consciousness, or that which is immediately prior to that series of organic phenomena, which constitute nervo-muscular action.

The motions independent of desire, may be arranged under the following heads:—

1. Motions immediately consequent upon certain organic conditions, without sensation.
2. Upon simple internal sensations.
3. Upon external sensations.
4. Upon emotions.
5. Upon a vague principle called imitation.
6. Upon habit.

1. The first group of involuntary motions, is constituted by those which are immediately consequent upon certain organic conditions, without sensation. It includes all the muscular actions which belong to the mere nutritive life of the system,* and which result from a property in the organization of the part, called irritability, and the application of a stimulus. Such is the contraction of the heart, excited by the stimulus of blood, such also the vermicular motion of the stomach and the intestines. The action of the respiratory muscles belongs to this head, though there has been some controversy on the subject. Some physiologists are of opinion that the movements in the function alluded to are occasioned by a sensation of distress, and a consequent desire of relief produced by the venous blood in the lungs;

* These have been generally, but very erroneously, made to *monopolize* the term involuntary.

but there is no evidence from consciousness that in ordinary respiration any such sensation does actually take place. It is true that when an obstacle is presented to the aeration of the blood, we for the most part experience uneasy feelings, which are followed by voluntary exertions of the accessory muscles of respiration; but in that kind of respiration which is commonly going on, and frequently when consciousness is altogether suspended, or occupied with other subjects, all that we know of the causation of the muscular action amounts to nothing more than that black blood reaches the lungs, and that the diaphragm descends; and we have as much reason to say that the former event is the stimulus of the latter, as that blood is the stimulus to the contraction of the heart; the only difference being, that the influence of the black blood in the lungs upon the movements of the diaphragm, is probably transmitted by nerves.

2. We pass on to the second head—of motions consequent upon internal sensations—which comprehends many interesting actions, and among them certain kinds of respiration, which are frequently characterized as voluntary, though possessing no title to that designation. Respiration does not become voluntary till a feeling of desire has arisen for increasing the action, or for overcoming an impediment to its exercise; but on many occasions uneasy sensations in the chest occur, and are followed by an increase of respiratory movement, without any mental feeling amounting to will or desire; as for instance, in those occasional muscular contractions which constitute sneezing, sighing, coughing, laughing, yawning, &c., and which all belong to the class respiratory. A tickling sensation in the nose causes sneezing; a sensation of weight about the lower part of the chest, sighing; an irritation in the windpipe, coughing; and in each case the action instead of being prompted by the will or desire, takes place in direct opposition to it. We shall content ourselves with merely hinting at these instances, in order that we may have more time for considering certain other interesting movements which belong to the present head; those, namely, which are employed in preserving the balance of the body.

Every one by experience knows both the feeling of equilibrium, and the fear of losing it. Yet there is nothing more worthy of admiration in the whole animal economy, than the fact, that without any knowledge of the centre of gravity, or of its situation in the body, or of the law by virtue of which a body must fall if a perpendicular

from the centre of gravity passes outside of the base of support, a person shall notwithstanding experience a sensation which gives him an apprehension of falling, whenever the centre of gravity is lost; but when we consider that this sensation is immediately followed by instinctive motions, which tend to recover the lost centre, our admiration must rise still higher. But although the process of equilibration is essentially instinctive or involuntary, it may be much assisted by voluntary exertions and practice. No instinctive feeling or motion could keep a person balanced on a tight rope, on the first occasion of trying that position. The constant use of this feeling in some of our ordinary movements is very striking. Let us take that of walking, for instance, and endeavour to analyse it. The very first action is a shifting of the centre of gravity, which would otherwise be lost in the subsequent movements. To prevent such an occurrence, the weight of the head and trunk is thrown upon one inferior extremity, instead of being shared between the two. After this has been accomplished, the other leg is bent, raised, projected, and replaced on the ground: when replaced it is in a state of extension. The next movement is to throw the centre of gravity into a perpendicular between the legs, by rotating the posterior leg on the foot, and bending the anterior knee. The weight is then shifted to the anterior limb, by raising the heel of the hinder foot (which acts as a lever of the second order) the leg being kept in a state of extension by the same action, so as to form a sort of inflexible rod for pushing the pelvis forwards. Lastly, the hinder leg is bent, raised, and brought up to the other. This is the analysis of a single step, the constituent movements of which require comparatively little nicety of equilibration; but in walking, the weight of the body is not only transferred from one limb to the other without any intermediate rest, but while poised on the one, suffers a motion of rotation on the head of the thigh bone, of much greater extent than in the former instance, because the hinder limb is not replaced upon the ground when it has come into a line with the other, but is kept suspended and projected. During the latter process, the weight of the limb and the action of the muscles which throw the body forward, tend to disturb the equilibrium; the weight tending to one side and the propulsive force to the other.

The walk of aged and feeble persons consists of a succession of steps, because in these movements there is less muscular power required, both in balancing the body and in projecting the limbs. A

person who either from weakness or intoxication does not enjoy a full command of his muscles, or, in other words, whose muscles do not act in harmony with the feelings peculiar to equilibrium, has a rolling gait, occasioned by one leg passing in front of the other. This action results from a want of the natural adjustment between the propulsion, the rotation, and the transference of the weight.

Giddiness is the loss of the feeling of support; but what is the cause of the natural feeling of support, or equilibrium? On first putting this question, it might seem to be answered by saying, that the feeling in question is only that of pressure in a particular part of the body. The whole weight of the system resting on so small a surface as the sole of the foot, must occasion considerable pressure; and although we have ordinarily no consciousness of it, yet the removal of that pressure, as in the case of falling, may produce a sensation, on the same principle as that which often causes us to feel the absence, but not the presence of a stimulus. This expression, however, is not very logical; it only means that the nerves of a part having been long accustomed to the presence of a certain object, cease to communicate any impression in connection with that object, but that the removal of the object occasions a new condition of the nerves which is instantly recognized. This fact has been experienced by every one on leaving off a ring, or any article of dress that made some degree of pressure; the loss of it is immediately discovered, though its presence had been forgotten. Is it a similar feeling which constitutes the sensation of falling, that is, loss of support? We can scarcely account for it in this manner, because the feeling is not referred to the part which had previously been suffering the weight; on the contrary, it is diffused and only like itself. The question then recurs, how is the feeling caused? We cannot doubt that although it cannot be identified with the sensation of pressure just alluded to, it bears a very intimate relation with the state of the nerves in the parts which sustained the pressure. When the body is supported, there must be compression in some part or other, greater or less according to the extent of the supporting surface; when not supported (as when we lose the centre of gravity) there is no such compression. Now although neither the existence nor the absence of this compression may be attended with any *local* sensation, it is easy to conceive that those parts of the brain,* which are the seats of the feeling and determine the

* The existence of such parts has been proved by modern vivisectors of animals.

motions of equilibration, may entertain such a relation with the distant nervous extremities, as immediately to undergo a change when the compression of the remote organ is removed, and in that change to produce the feeling which we designate loss of balance, and to excite the corresponding actions.

Derangement of the feeling of equilibrium may have causes either external or internal. To exemplify the former:—a person standing on a high ladder, or on a plank stretched over a chasm, may easily lose his feeling of equilibrium, notwithstanding the same degree of pressure is made as is usual in the upright posture. He is disturbed by his vision, which can perceive no support but the surrounding air; he imagines that he is falling, and instinctively throws himself into an attitude which was intended to preserve the centre of gravity, but which in reality overthrows it, and thus he falls in reality. *Internal* causes are more common;—*e. g.* some disturbance of the nervous system produces in the individual a false kind of vision; objects appear to move, and the ground on which he stands seems to rise or to fall from under him. He in this case, as in the former, assumes an attitude adapted to his false conception of his relation to the ground on which he stands, and suffers a similar consequence. Or his nervous derangement may be of a different kind. He may experience the sensation of being himself tossed up and down, or whirled round and round, when his support is in reality most secure and his muscles are in a state of inaction, as for instance, in the recumbent posture. Many persons have known this feeling after inhaling tobacco for the first time; and it is said to occur to the drunkard, either when staggering and reeling, or when prostrate on the ground.

It would seem that in some cases of vertigo, the *feeling* of giddiness is not a perverted one, but that the disorder of the nervous system relaxes the muscles which usually preserve the erect posture; and that upon this relaxation the body is in peril of falling, and is felt to be so. In this instance the sensation is a true one, that is, indicates the actual condition of the body. The individual thus affected, catches at some support with his upper extremities, which perform the duty of the lower ones.

In the lower animals the motions of equilibration are sooner developed than in ourselves. The kid follows its mother on the mountain side on the very day of its birth; and the chicken walks as soon as it has left the shell; but the child suffers many disappoint-

ments before the feeling in question is followed by its appropriate motions.

It would be interesting to enter into further details upon this subject, but enough has, we hope, been said to shew that desire or volition has no necessary connection with the actions that belong to equilibrium.

3. The next class of instinctive motions are those immediately consequent upon external sensations.—A remarkable instance is the suction of the infant. The simple sensation produced in the lips induces those beautifully connected actions of the muscles of the tongue, mouth, and pharynx, which extract the nutritive fluid. Sometimes the mere tactual impression is sufficient; at others it is necessary that the taste should be excited. No one can for a moment suppose that the infant exerts any volition or feels a desire for the muscular movement in question. If from any circumstance the fluid excites disagreeable sensations his muscles do not act. When he has become familiar with the gratification he appears to have the power of increasing the actions; *i.e.*, he remembers the motions which have formerly produced enjoyment, and desires their repetition to a degree which wonderfully increases their energy. He also becomes able to suspend them either from mere caprice, or from other motives, even when the sensation which was wont to provoke the action is scarcely less agreeable than formerly. In animals this kind of instinctive movement consequent on sensation is very remarkable. The lamb just born follows its mother by sight; the blind puppy by scent; and the newly-hatched chicken pecks at grain. Another example of the class before us is the motion which follows an impression of pain. Place a hot body on the hand of a person in deep thought, and the latter is retracted immediately. If a person walking rapidly round a corner happens to come suddenly upon the margin of a pit, the sight produces instantaneously a movement the very opposite to progression. In this case the vision and motion are *all but simultaneous*, and certainly have no intervening desire or volition. Some motions belonging to this class take place in opposition to desire. Winking the eye is a motion which follows the sight of any thing which threatens the organ with injury. It is a common trick among school boys to attempt to restrain the action when a body is made to appear to approach the organ; but it is only after repeated trials that the attempt succeeds.

4. The fourth class comprehends those movements which are

prompted by emotions. From this category we must by necessity exclude such movements as are the *objects* of desire, though the exception does not extend to those which merely follow the desire of *other* objects. Some of the most common instances of the division under consideration are the muscular movements expressive of the passions. The greater number of these occur in the face, and their character is familiar to every one. Whether the recognition of the presence of a passion in another person be the effect of instinct on association, would perhaps admit of some question; but no one doubts of the fact. Joy, sorrow, anger, complacency, fear, courage, confidence, distrust, all have their lineaments in the quick darting motions of the eye, the varied surface of the cheek, the expansive nostril, the pliant lip, and the smooth or wrinkled forehead. All the changes in expression occur merely because certain emotions have occurred, and there is no intermediate mental event. A struggle for predominant expression often takes place among the emotions, when several are present or occurring in quick succession; but the strongest is, *cæteris paribus*, that which is obeyed by the muscles. No emotion is oftener contradictory of the others than desire. A man conscious of a particular passion, and that it may be betrayed by his face, desires to restrain the manifestation. His success will depend on the degree of the first emotion, or on the frequency with which his facial muscles have assumed an arrangement indicative of the state of mind which he wishes to simulate. Gestures are of a nature precisely analogous to physiognomical expression.

Under the present head we may also arrange those vocal movements which communicate particular feelings, and are common to all ages of the human being, and to all animals possessed of vocal organs. The shriek of terror, the scream of pain, the sigh of grief, the yell of resentment, the exclamations of joy and delight, are as every body knows involuntary,—nay, sometimes *anti*-voluntary. But they may all own desire for their cause, like gesticulations and changes of countenance when we are anxious to feign the passions which they indicate. The emotions which approach more to intellectual conditions are also related with muscular actions altogether involuntary. The perception of the beautiful, the sublime, the wonderful, and the ludicrous, are all attended with appropriate demonstrations, and none more decidedly than the last.

The group under discussion includes certain actions of the mus-

cles of respiration, which have not received that degree of attention which they deserve. Every one must have noticed the alterations of breathing under the influence of emotion. It becomes quicker or slower, or is interrupted, merely as it would appear in consequence of the excitement of the nervous system; but the final cause of the derangement is by no means evident. When two or more persons are engaged in some action which requires stealth and silence, it is common for them to remind one another to hold the breath, lest it should be audible. But why should this injunction be necessary? Under ordinary circumstances respiration occurs as noiselessly to others as unconsciously to the subject. No other probable solution of the question occurs to me than the following. On occasions of the nature alluded to, the solicitude or mental attention produces an unusual excitement of the nervous system, and a consequent hurry of the breathing, which becomes audible; and it is to restrain this derangement of an ordinarily quiet action that the voluntary effort is enjoined. Something also may be due to the prolonged intervals between inspiration and expiration, demanded by those movements in which particular care and nicety are requisite. In such cases the chest must, for longer intervals than ordinary, present a steady immovable fulcrum to various muscles, a condition which can only be effected by the closure of the windpipe, and by the consequent prevention of the ingress or egress of air. The mere attention of the mind to a sensation, that of hearing, for instance, will likewise cause an irregularity of respiration; a fact familiar to every one who has listened with anxiety to a faint sound, the step of an expected friend, a distant echo, an important whisper, &c. Mere intellectual excitement will produce the same effect. Who has not remarked the hurried or suspended breath of an audience, under the influence of a powerful harangue?

5. The fifth section embraces those movements which pertain to imitation. Imitation may be active or passive, *i.e.* prompted by desire or independent of it. The latter only concerns our present subject. One person yawns, or sighs, or laughs, because another does; a fact utterly inexplicable in the present state of our knowledge.* Any set of muscles may acquire particular actions and assemblages of actions, by passive imitation only; and to such a degree, indeed, that desire is often vainly employed in opposition to this principle. A child or

* Some fancy that they can explain the fact by referring it to sympathy. But this is only comparing it to something equally unintelligible which occurs in the system of a single individual.

susceptible female, if frequently in company with a person who winks, or stammers, or falters in his gait, will fall into similar habits, notwithstanding there may be a variety of inducements for attempting to avoid them. The following passage from Coleridge's "Christabel" is a well-drawn picture of involuntary imitation :—

"The maid, alas! her thoughts are gone,
She nothing sees—no sight but one!
The maid, devoid of guilt and sin,
I know not how, in fearful wise
So deeply had she drunken in
That look, those shrunken serpent eyes,
That all her features were resigned
To this sole image in her mind;
And *passively did imitate*
That look of dull and treacherous hate.
And thus she stood, in dizzy trance,
Still picturing that look askance,
With forced unconscious sympathy,
Full before her father's view."

In a similar manner persons contract the pronunciation of others; a fact that will account for national peculiarities of accent. The laugh of a crowd, nay, its gestures and acclamations are often quite as much the result of this principle of imitation, as of similarity of feeling derived from a common source. But the most remarkable instance of involuntary imitative motions are observed in various disorders of the nervous system. The contagiousness of hysterical exclamations and convulsions is known to every one. Physicians are not unfamiliar with the communication of other disorders of motion of a more serious nature; such are the imitative forms of epilepsy and chorea, to the latter of which we shall recur directly. Such affections are not only without desire but contrary to it. The influence of the principle under consideration is of the last importance, not only in a physical, but also in a political and moral point of view. It has too often happened that the most atrocious crimes have been repeated by persons, who are not only free from the operation of motives similar to those which instigated the first perpetrators, but whose minds may loathe the very contemplation of such actions at the very time that the morbid impulse is hurrying them on. It has long been matter of observation that one suicide creates many. A remarkable fact of this kind is related by M. Andral. "A few years since, at the Hotel des Invalides, a veteran hung himself on the threshold of one of the doors of a corridor. No suicide had occurred in the establishment for two years previously;

but in the succeeding fortnight, five invalids hung themselves on the same cross-bar, and the governor was obliged to shut up the passage. During the last days of the empire, again, an individual ascended the column in the Place Vendôme, and threw himself down and was dashed to pieces. The event caused a great sensation; and in the course of the ensuing week, four persons imitated the example, and the police were obliged to proscribe the entrance to the column." Would that the influence of a morbid imitation were confined even to self-murder! Such, however, is far from being the case. The study of that most awful of all kinds of mental alienation, the homicidal monomania or murder madness, reveals but too many facts confirmatory of the principle, that persons, altogether uninfluenced by any ulterior object, may perpetrate actions most revolting to the moral nature of man in its healthy condition; and that the only discoverable reason is, that such persons have witnessed or heard of the commission of similar atrocities by others! So convinced are we of the injurious influence which the narration of crimes exerts upon individuals of a susceptible temperament, that we should rejoice to see some kind of restraint laid upon that extreme license with which the details of crimes are constantly obtruded on the public eye.

It is impossible to find more striking instances of the influence of imitation or sympathy than in the records of certain epidemic nervous disorders. Dr. Hecker of Berlin, the author of the History of the Black Plague, has written a most curious narrative of the epidemic dance of the middle ages, a French translation of which we have perused in the last number of the "Annales d'Hygiène."* Dr. Hecker relates that soon after the cessation of the black plague, in the fourteenth century, bands of men and women, afflicted with the derangement in question, used to wander from village to village, and even through towns, presenting to the inhabitants a most strange and distressing spectacle. They were wont to form in circles, and then to dance with the greatest violence and transport, whirling themselves round and round, utterly unconscious of every thing about them, till they fell exhausted to the ground. They suffered spasms and convulsions of the most torturing description till the paroxysm abated. During the dance, they often beheld apparitions; some were blessed with visions of angels, and with glimpses of heaven, while others could perceive only demons and flashes from the infernal regions. Wherever these

* Since the above was written, an English translation of this history, by Dr. Babington, has been announced.

unhappy individuals arrived, numbers of the inhabitants became similarly affected. To prove that this communication of the malady was the effect of imitation or sympathy, Dr. Hecker states that the sight of certain wretches, who, for the sake of gain, affected these antics, produced the same results as in the true cases. These dances were honoured with the names of St. John and of St. Guy; of the former, because they commenced at certain religious ceremonies sacred to that apostle (which, however, resembled Bacchanalian orgies rather than Christian rites); of the latter, because many sufferers had been cured in the chapels of St. Guy, whom they were therefore bound in gratitude to consider their patron saint. The epidemic was not extinguished for nearly two centuries. One not unlike it prevailed in Italy, under the name of Tarantulism. The persons affected fancied themselves bitten by a particular kind of lizard, and became melancholy and stupid, till aroused by the music of the flute or guitar; they would then become animated, and commence dancing in a most extravagant manner, never giving over till overpowered by extreme fatigue. Sometimes the patients had a vehement desire for the sea, and flung themselves into it. The disorder disappeared in its epidemic form in the eighteenth century. Hecker alludes to a similar affection which prevailed in Abyssinia, under the name of Tigretier, and which has been described by our countryman, Pearce. It had the same dancing character, and was soothed by music. The irresistible tendency to imitation was strongly marked in the case of a woman, (related by Tissot) who never could avoid doing anything which she saw others do, and was consequently obliged to be blindfolded when she walked the streets. To the operation of the same principle Dr. Hecker attributes certain fanatical exhibitions among the Jumpers in our own country, whose fame, it appears, has extended to Germany. Locality is often deeply concerned in the production of similar incidents. Thus we are told by a French author, that a supposed miracle having been performed before the convent of St. Genevieve, such a number of similar occurrences happened on the same spot in a few days, that the police were compelled to post a peremptory notice on the gate, "prohibiting any individuals from working miracles in the place in question."

The limits prescribed to this essay oblige me to abstain from further remarks upon this subject, else it would be interesting to trace the imitative instinct in certain of the lower animals, to shew its subservience to various important purposes in our own species, such as its vast relations with the moral and social condition of man, its connection

also with the facts that belong to animal magnetism, and with various kinds of mental aberration.

6. The last group of involuntary actions are those of habit; a term inclusive of a variety of most interesting motions, which although originally produced by desire, have acquired an instinctive character. It is a law, no less constant in the intellectual and moral, than in the corporeal œconomy of man, that actions which have frequently co-existed, or followed each other in a certain succession, have a tendency to repeat that association or sequence, even when the causes which originally produced them are no longer acting. Thus, let A, B, and C, represent so many muscular motions which have followed each other, but which have each been effected by desire. After a repetition of their occurrence a certain number of times in the same order, they will stand in the relation of causes and effects to each other. It will no longer be necessary that an act of volition should transpire between A and B, or between B and C; but the mere occurrence of A, will be enough to produce B, and B will have the same effect on C. In our walking and active moments we can scarcely exist without affording an illustration of this law. To walk, to run, to assume any ordinary attitude, to perform any common manipulation, to speak, to write, is to present an exemplification of the same principle. To all the elementary motions of which these actions are composed, desire or volition was originally, perhaps, a necessary antecedent, but is such no longer. Let us take the instance of walking. A person wishes to fetch a book at the other end of a room, and walks in search of it: in this performance, does he will the several motions in which walking consists? If he has been enfeebled by disease the muscular actions may require the stimulus of desire, but in ordinary health and strength he goes through the evolutions unconsciously. How is it then that these voluntary actions take place without any volition at all? The explanation is a very simple one, and we cannot help wondering that some very able thinkers have thought it necessary to conjecture that in such a case the individual must in reality have willed each separate movement, but that the acts of consciousness were so brief and transient that he had forgotten them. The true theory appears to our apprehension involved in the fact, that the motions in question have so often followed each other that the mere wish to perform the particular action which they compose is enough to prompt the whole series. But it is not necessary that the person should even thus far will the motion. It is enough that he wishes a certain change of place, and the action

which has so often followed this wish occurs without the additional impulse of any other desire or act of volition separately devoted to it. Moreover, he may walk in a certain direction, without any desire at all. He may set out towards some point, his will having merely directed the initiative movement. In the course of the walk, his mind becomes occupied by various thoughts, and the intention of his journey not being constantly present, he is liable to be carried in a direction very different from that which he had designed. He arrives, perhaps, at a turn in the way which he has been accustomed to pursue, and is taken along it unconsciously, far out of his original plan. He may even find himself knocking at the door of a deceased friend, or of one whose acquaintance he had dropped. In the latter case, the sight of the road, or of the house which was wont to determine his desire for moving towards it, has been sufficient to produce the movement (without any intermediate desire) by the mere force of habit; which will continue to operate, till he is reminded of his intention of proceeding in a different direction.

Let us try another instance, that of speaking. The articulation of every word was once, perhaps, the result of effort; a voluntary exertion of the vocal organ to imitate a sound produced by another. But now it is enough for the word to occur to the mind, and the pronunciation follows, without any intermediate volition, merely because the idea and the action have been accustomed to the relation of antecedence and consequence. Again: I may use some word which I not only did not intend, but which I would much rather have avoided, as it may be personally offensive to the person with whom I am conversing. This word, in all probability, will be found to be similar in sound to that which was present to my mind, but which was not expressed by my voice. The word was the product of a certain aggregation or series of vocal movements, which followed some initial movement common to it, and to that other series which properly belonged to the idea in the mind. This we conceive to be the meaning of what is commonly called a *lapsus linguæ*, and is very different from a malapropism: *the latter is a mistake of the mind, the former is a mistake of the muscles.* A similar error not unfrequently occurs in writing. A perfect master of orthography may commit a mistake of this kind; he may write, for instance, the adverb *there*, though the pronoun was in his mind, merely from an irregularity of muscular succession. The tracing of a word on paper is the result of a particular set of muscular movements; but words of very different meanings may have very

similar sets, and even initially identical, as in the instance just mentioned; and hence the mistake arises. We have heard persons say that a bad pen would make them mis-spell; in such a case, the impediment offered by the pen causes an irregularity in the succession of the movements. But it may be asked, how is it that we sometimes utter or write a word no less dissimilar in sound and in symbolical characters than foreign from the subject discoursed of? The causation in this case is different; the error exists in the mind, and arises from our being occupied with more than one series of ideas; in which case an accidental exchange takes place between the series communicated, and that which is retained. To a person engaged in writing, when others are talking around him, the accident is very liable to happen. Some word makes a particular impression on his mind, and diverts him a moment from his previous train of thought; but his muscles continue to act, and follow the impulse of the word in question, as of any other that passes through his mind more germane to the matter in hand. From what has been said, then, it is deducible, that there are motions immediately consequent on ideas, in the same manner as others are consequent on sensations and emotions; but we have not arranged the former in a separate class, because we are not aware of any evidence that *ideas* assume the relation of proximate causes to *motions*, except under the operation of the general law or principle which we have been engaged in illustrating; while sensations and emotions, on the contrary, manifestly produce their appropriate actions without any reference whatever either to association or succession.*

From the consideration of habit in connection with muscular motion, we cannot resist the temptation of an easy transition, to offer one or two remarks upon talent. When a person is observed to be particularly skilful in any art or operation, it is common enough to

* The beneficial influence of this law of muscular action will be obvious, on considering the inconvenience that would arise, were it necessary that the mind should be constantly directed to our ordinary actions. Authorship would be as rare as now it is frequent, were a writer's thoughts to be distracted by attention to his manual employment. How many sublime meditations would have been lost to the world, if the legs of peripatetic philosophers had required the constant superintendance of their minds. Or to come down to more ordinary pursuits; the knitting needles of the intelligent lady would make but slow progress in their charitable employment, were her muscles unable to guide them without the direction of the mind, which is engaged in the conversation of her friends. How could the weaver sing his psalms, or the waggoner whistle his rustic strains, did the shuttle of the one, or the whip of the other, require that mental attention which is occupied by their respective melodies?—Hundreds of such instances will occur to every one.

allege two different causes for his dexterity. In the opinion of one speculator it is due to practice or habit; of another, to original power or capability. In some few cases, only one of these opinions may be right; in the majority they will both be correct. Habit, we have said, is the tendency of certain actions to co-exist or to succeed each other, for no other reason than that they have formerly been co-existent or successive; hence the facility of an often practised movement. Talent is a peculiar constitution of an individual, by virtue of which a succession of actions which in other persons must have very frequently succeeded each other, in order to be performed readily, do in that individual occur easily at the first effort, or after a very few efforts. A difficult operation is one that with most persons requires a number of oft-repeated desires, or volitions, or attempts (attempts being actions begun and not ended), but which may become perfectly easy afterwards. Yet this operation may to one individual be easy at the first inclination of his mind to perform it, whence he is said to have a gift, a talent, a genius for it. If the action partake of the sublime or beautiful, as in the execution of a fine painting or sculpture, he may even be said to be inspired. But whatever name or expression be annexed to the facility in question, it implies that very little desire or effort is necessary, and that the actions produced by it approach very closely to the instinctive. To instance a talent for drawing. One boy shall, upon the first attempt to copy any object on paper, produce a far more correct representation than one who has made twenty attempts. For producing a successful copy two things are necessary—a correct remembrance of form (for it is impossible to look at that which is to be copied, at the time of using the muscular action which directs the lines) and the occurrence of such muscular movements as direct the pencil along an imaginary line on the paper, corresponding to the one remembered. The figure, or a part of it, must be imagined on the paper and traced by the hand. A talent, then, for drawing, signifies a correct memory of figure, and a facility in executing the requisite movements. The former may be present, but without the latter will never ensure success to the efforts; nor the latter without the former. The separateness of these facilities may often be noticed in children when learning to write, which is obviously a kind of drawing. One will be able to trace in ink, with great neatness and regularity, characters which have been marked in pencil; thus shewing that there is no defect in the muscular actions; and yet shall be incapable of

tracing them without this assistance. Another, again, may have a sufficiently definite conception of the form, and yet fail in the delineation from want of muscular readiness. Each, however, after many unsuccessful efforts will attain his object, and even perform the operation with ease, by help of that principle the discussion of which has led us into observations far more lengthened than we originally contemplated.

A retrospect of the several classes of motions which have passed under our survey will convince us, that to say the least, a very large share of the movements commonly considered to be the immediate and exclusive products of volition may and do most frequently originate in other states of mind. Perhaps the following attempt at a classification, if useful in no other respect, may serve the purpose of recapitulation.

1. *Involuntary Motions.* Synonymes—*Organic*, *Automatic*, *Instinctive.* Character—In ordinary circumstances, unoriginated, and uncontrolled by desire, and often opposed to it.

2. *Voluntary Motions.* Synonymes—*Animal*, *Relative.* Character—Controllable by and coincident with desire, but not indebted to it for their origin.

3. *Volitional Motions.* Character—Originated by desires, of which they are the sole objects.

We are fully aware that this arrangement is liable to the objection, that the same specimens of muscular actions might at different times be placed in different classes. Thus coughing, when induced by a physical necessity, and contrary to the inclination, would belong to the first; when occuring physically, and capable of being checked, but allowed to continue because known to relieve the chest, would be ranked in the second; when produced for the sake of mimicry or affectation, its place would be in the third. Difficulties of this kind attend classifications of every science; but if they afforded us any assistance in distinguishing phenomena their end is answered.

To some of our readers it may at first sight appear that we have been busied in a mere controversy of words; but a further consideration will, it is hoped, convince them that actual diffences of *ideas* have been involved in the discussion. But if they should urge that it is useless, or laborious trifling, to spend so much time in distinguishing such faint shades of thought, in untangling such gossamer webs, they might be asked (without dwelling upon the advantage of keeping in readiness

and keenness, by constant exercise, that faculty of analysis which is the chief and essential instrument of all true logic,) whether such topics as have engaged us, may not be at least as fit objects of consideration, as whether there be a resisting medium in the universe or not, whether light be a radiation or an undulation, whether the central vessels of a plant carry sap or air, &c., &c., questions which are justly esteemed very worthy of the attention of philosophers, not because they are applicable to any practical purpose, but because they are questions of truth. All branches of knowledge are liable to such objections as we have alluded to. And if it be asked, why say so much about things so well known and familiar as desire, and will, and motion? we content ourselves with replying, that a similar question might be put to the geologist, what possible good is there in looking so earnestly at a bed of gravel?—or to the botanist, why spend so much time over a handful of common weeds?—or to the entomologist, what can you find to interest you in the dissection of a beetle or butterfly? Such idle queries are constantly asked by the ignorant, to whom all things are alike—for whom there are no differences. But it is more to be lamented, that individuals extremely well informed upon one branch of science should depreciate other branches, which they do not happen to have studied. Thus a person whose attention has not been directed to the phenomena of mind, and their connection with organic action, may feel disposed to consider discourses on such subjects as necessarily dull and unintelligible; or may pronounce upon them a very common damnatory phrase, "mere metaphysical jargon." But it would be fair to remind him, that it is far easier to condemn a science than to study it;—that a landscape might be possibly beautiful, notwithstanding a person might not choose to look at it;—and that a Chinese might consider the language of Homer and Plato an unmeaning gibberish.

As it regards the particular topics of this paper, the writer begs that their capability of affording matter for interesting meditation may not be judged of by the manner in which he has handled them. Any obscurity, or wearisome intricacy, should be charged less against the subject than against the choice of the expressions, and the construction of the sentences.

HABIT.

A Lecture delivered at the Bristol Institution, May, 1853.

I PROPOSE on this occasion to invite your attention to a class of phenomena generally designated by the word Habit. This word, as you are aware, is one of various meanings; and yet through them all you will find a thread of connection. It denotes that which has been observed so often in a living organism, that it is regarded as having something of permanence or constancy in a being which is evermore liable to change. It sometimes implies a cause; as when we notice that a friend has become stout or thin, and our suspicion is put down by the remark—"Nay, but he is of a full or spare habit,"—which means, that there is something in his original constitution, whether derived from inheritance or noted in an early period of his history, which is considered to be the cause of what has become the ordinary condition of this person's frame as to plumpness or leanness. Or it simply expresses a mode of action, the final or ultimate explanation of which is simply that it has occurred so often as to be always looked for. A stamp of permanence has been given to what at first might have been regarded as casual and temporary—that is, begotten of the circumstances under which it first originated, and to be expected to recur only under like conditions. This reference to habit as something ultimate or final, springs from the tendency in the human mind to acquiesce in the customary. From the unreasoning peasant, who quietly tells some traveller, startled by what he conceives to be a foolish or even outrageous mode of action, *that it is the custom*, to the philosopher, who, unable to discover any more remote antecedent to the chain of sequences under his survey, says, that such is the natural order of events, the mental tendency is the same. A

thing familiar is customary, and what is customary is acquiesced in. Nay, there is a tendency to imitate it passively. And what was an individual trick or habit becomes a fashion or social convention.

Habit is sometimes used in a more vague signification, as when we speak of the habits of animals or their customary actions, and when it would be more correct to say, instinctive actions. But in this case, the habits are referred to as the effects of the instincts. And if the phrase "Instincts and Habits" of animals be used, it is intended to distinguish that mysterious principle called instinct from the action which it prompts. Not, however, that habit in its strict sense may not be predicated of the lower animals; for as they are the subjects of volition and reasoning processes to a certain extent, so also they may be subject to habit.

It is not uncommon also to speak of the habits of nations or races, meaning thereby, such modes of life and action as are usual to them. Perhaps in all the senses of the word we shall find a connection with its etymology, and that it bears reference to something which has been held *(habitus)*—retained after being acquired; something added to the individual, and henceforth always associated with him. Again; *dress* is a *habit*, and *coutume* passes into *costume*. But we have to treat of habit in a more restricted sense, or as I have expressed it in the title to this lecture—"Habit physiologically considered." As physiology is the science which treats of vital actions, so we have to investigate habit with reference to these, or at least to some of them. We shall consider it in reference to those which constitute the life of relations in man—those functions which place him in relation with the outward world—sensation, motion, and thought. But while each of these heads will have some discussion, the greater part of our survey will be devoted to habit in relation to motion.

Some of the most curious examples of actions resulting from habit are to be found among those which we generally associate in our minds with the prosecution of some purpose, the relief of some feeling, the expression of some emotion, and yet in these cases there is no such final cause discernible. "Why does Mr. Thunderton speak so loundly and angrily? does the occasion call for it?" "Oh, that's his way—it is a habit he has got." "What does Mr. Scrutator find so very remarkable in us? Do you see how he fixes his eyes upon us?" "Oh! that's nothing—he always does so—it is his habit." "Don't you pity that poor gentleman? he is obliged to cough at every

clause of his sentences." "Oh, no, he is quite well. We call it his interjectional or ejaculatory cough; and very expressive it is, like that of one of the fictional characters of the day; it is a habit he has fallen into." "That person must surely be very unwell—very giddy.—See how he sways about in his walk—he will surely fall." "Oh! no,—he always walks in that way—he got the habit early in life." "What is that gentleman in search of? Do you see how he examines everything on the table and mantle-piece? What is he looking for?" "That shows you don't know him! We never notice it—he has had that habit as long as we have known him—many years ago." These cases might be multiplied indefinitely. In each you observe that an action which appears to a stranger to be generated by a particular occasion or circumstance, is by one familiar with the subject of it explained, and seemingly quite to his satifaction, as being an *habitual* eccentricity. That action, or manner, or mode of expression which strikes us as odd and exceptional, has in the observation of others occurred so frequently as to be considered necessary to the individual, the result of his acquired bodily or mental constitution. It is, in common phrase, "second nature,"—Habit.

We are not, however, about to spend much time upon these abnormal instances. For in the category of Habit must be placed a great number of our most ordinary and familiar actions. Such are those actions which have become secondarily instinctive, or automatic; —those wonderful acquirements which we call standing, walking, running, grasping and handling, speech and talking, and those less universal but still not uncommon accomplishments of swimming, climbing, dancing: all the manual arts or handicrafts, and the fine or æsthetical arts: all these belong to habit, as a principle of action, no less than do those actions which we call mechanical, and those aberrant movements which are designated nervous tricks and figets.

Habit in Relation to Motion.

The function of muscles is, as you are aware, to move some part or the whole of the body, or to impress some motion on surrounding objects. A muscle is a bundle of fibres, which, in shortening themselves, bring their two ends nearer to each other. For various reasons, which we have no time to consider, several muscles act together in effecting particular movements. It is obvious, therefore, that they must

act harmoniously, and to effect this they are under the governance of a central impulse. The muscular fibres are called into action by motor nerves, and the impulses in these several motor nerves are associated, or derive a unity of origin from a nervous centre, as it is called, a part which receives an impression or imparts an impulse. Within the compass of the spinal cord and the brain an immense number of these centres or ganglia are congregated, and so closely packed together as to seem to be one substance.

Some movements in the body are unaccompanied by sensation, and not instigated by the will;—these are often called the involuntary, and sometimes instinctive, movements. All the mechanism consists in the transmission of an impression by an afferent nerve to the ganglion which originates an impulse in the motor nerve. These movements may occur in an animal deprived of consciousness, or the susceptibility of feeling, as well as in one possessed of it. Thus, suppose the spine of a frog has been cut across the middle, if you pinch the extremity of one of the hinder limbs the whole limb will be retracted. We are constantly the subjects of many such actions; one of the most striking examples is the series of muscular actions employed in breathing: a wonderful congeries of muscles which open the aperture of the windpipe, expand the chest, and so admit the fresh air, and afterwards expel the air which has yielded its oxygen to the wants of the blood—all these are put into action by different nerves, which convey an impression to the central respiratory ganglion, which sets in motion the requisite muscles. These movements are often accompanied by sensation, and may be altered, to a certain extent, by the will; but they are quite capable of going on, and in the healthy state they always do go on, without the one or the other, as we know at the present moment. Were other proof needed, it would be enough to observe the breathing in a person profoundly asleep or rendered insensible by disease, or in an animal deprived of those parts of the nervous system which minister to sensation and volition. This class of automatic movements has been called of late years reflex, or excito-motor.

There is another set of movements which are prompted by sensation, and are yet independent of the will. They are designated by some physiologists as consensual. Dr. Carpenter uses the term sensori-motor. I shall employ the term sensational; and, further, I think it desirable to discriminate these movements into two subdivisions—the subjectively sensational, and the objectively sensational. Now what do we mean

by subjective sensations as distinguished from objective? An objective sensation is one that gives us information of something in the outward world, something that does not involve our consciousness or remind us of our own individual existence. I see a green meadow, or hear the song of a bird, or smell the fragrance of a flower, without my mind being cognizant of anything but the objects which have excited the sensations of vision, hearing, and smell. These, then, are objective sensations. The subjective are those in which the consciousness is involved, the *ego*, the individual self, partially or exclusively. I touch a cold marble: while I recognise the marble as the cause of my feeling, and attribute to it a certain quality which gives me the feeling, my consciousness, or an affection of me, myself, as the subject of the outward operation, forms a part of the sensation. But this is a mixed example, and might be called an objective-subjective sensation. Take another example:—I feel *ill*. I do not know what is the matter with me,—I have no pain. I am surrounded by pleasant objects, and within reach of everything likely to make me happy; but I feel ill. This is an intensely *subjective sensation*. Take one more example:—I have a headache, *i.e.*, I feel pain and I refer the pain to my head. This is a mixed sensation;—it is subjective so far as the feeling of pain implicates the ego; it is objective with reference to the seat of the pain; that is, the part of the outer world constituted by the body. It may seem strange to talk of a person's own body as being external to his conscious identity. But if you consider the matter fully, you will find that the knowledge of our bodily organs is an acquirement, and not a part of the feeling of personal consciousness. A young child suffering pain in some part of the body is often quite incapable of saying where the pain is seated. In disturbed states of mind, the separateness of subject and object is very well shown with reference to these bodily feelings. I have known a person in delirium say to a bystander, "You have a dreadful headache, sir." *He* was the sufferer, but his morbid intellect linked the pain with the image of the person before him, instead of with his own body.

These sensations may then, I have said, whether subjective or objective, have motions immediately related to them; responding to them, as directly as those which are instigated by the will—often coincident with, and controllable by the will—but still having causation of their own.

As an example of subjectively sensational motions I may adduce

the act of coughing. A tickling sensation is felt in the wind-pipe; a series of muscular actions ensue, vehemently forcing the air out of the chest, and often not to be restrained or prevented by the will. Winking the eyes is another example. The movements which preserve the equilibrium of the body are mainly prompted and guided by subjective sensations, with but little and often no assistance from voluntary efforts. This governing feeling of equilibrium is directly related with pressure on the nerves of the feet, or whatever parts are supporting the rest of the body. If that compression be removed, giddiness, or a feeling of loss of balance is the result; and in an instant such muscles are thrown into action as tend to restore the equilibrium.

Of the objectively sensational movements, no instances are more striking than those which are associated with visions. Close one eye of an infant, and mark the movement of the eyeball as you shift the light before it—then let both be exposed, and see the admirable concert of action between them—and when you are acquainted with the muscles and their nerves that effect these movements, how nicely they are adjusted and balanced against each other, and with what delicacy they mutually respond, your admiration is great indeed. Though these actions are thus immediately related with vision, they may be, and very frequently are, the servants of our will, as when they fulfil our wish of looking in particular directions, or at different objects. But, in these cases, motion does not enter into our consciousness. The object of our desire is the sight of something. We *will* the seeing of it—that is, we look at it, inspect, examine it, &c., but we are unconscious that, in order to this, certain movements of the visual organ must take place. Here then is a palpable distinction between this class of movements and the voluntary: for in the latter, whether we know anything or not of the muscular instrumentality we are conscious that our wish is to be executed by a movement either of the whole, or of a part of a frame.

It is in this group of sensational motions that our actions are most closely analogous to those which subserve the instincts of animals. They are as *blind*, that is, as dependent on motives involving no foresight, no prearrangement of our own. They are as perfect—for we neither learn them nor teach them—they are the works of an art unteachable, untaught—and they were as complete in our first parent, when his eyes feasted on the natural glories of Eden, as in his latest descendant inspecting the wonders of art in the Crystal Palace.

Another class of movements are those which give outward expression to the emotions. These also occur without any intention or volition, whether they consist in the play of the features, or in the gestures of the limbs; joy, sorrow, anger, complacency, fear, courage, confidence, distrust, speak in the quick turns and ever-shifting hues of the eyes, in the varying surface of the cheek, in the expansile nostril, the flexile lip, and the smooth or knitted brow. To this head also belong those vocal movements which give utterance to particular feelings, and are common to all ages of the human being, and to all animals possessed of vocal organs. The screams of pain, the shrieks of terror, the sigh of grief, the yell of resentment, the shout of joy, are the instantaneous productions of these passions. The emotions which approach nearer to intellectual conditions are also related with actions altogether involuntary. Such are the perceptions of the beautiful, the sublime, the wonderful, and the ludicrous.

These emotional movements are interesting in a point which has not received much attention. The feelings prompt the movements; but it is no less true that the movements excite the feelings. And this, I think, is the key to some of those curious phenomena often thrown into the vague category of sympathy. A sudden panic in a multitude, a burst of enthusiasm, will spread like lightning. The individuals look round and see countenances and gestures expressive of a particular emotion, of which, in the very process, they themselves become the subjects. But you may say this is nothing but the instinctive reading of nature's language of gestures and featural expression. The best instance is in those anomalous states of the nervous system observed in persons subjected to mesmeric processes. Here the individual partially asleep, and with his will in abeyance, is at the mercy of any association suggested from without: close his fists and put his arms in a menacing attitude, and the emotions related with such movements are excited.* Passive imitation comprehends movements very analogous. Yawning is the expression of weariness. The sight of yawning engenders the related feeling, and our muscles answer to it.

Our next class of movements would be those which are directly

* The explanation of some of these strange mesmeric phenomena is admirably set forth in Dr. Carpenter's "Human Physiology." The chapter on the Physiology of the Nervous System in the last edition abounds in views highly original, and stated and illustrated with wonderful perspicuity and affluence. The members of this Institution should be proud of this production of one to whose voice these walls have so often echoed.

prompted (still without volition) by ideas; meaning, by this term, remembered sensations and thoughts as distinguished from those objects of consciousness which are immediately brought from the outer world. But as the best illustrations are derived from the group of allied movements which we shall have to consider as pertaining more particularly to the topics of this lecture—that is, the secondarily ideagenous—I shall not now adduce them. I must content myself with remarking that in various kinds of passive imitation we have specimens both of sensational and of ideagenous movements. You know how readily some persons contract a particular tone of voice from association with others. Now as the individuals often wish to avoid the infection, and yet do not escape it, the imitation is clearly passive and mechanical—the vocal movements which give the particular tone respond instinctively to the sound which has been so often impressed on the ear. But take a case of unintentional mimicry: you must have observed that when any one is relating an anecdote respecting the sayings or doings of an individual who has marked personal peculiarities, the narrator's face, tones of voice, and gestures, will represent the individual, though the operator has no intention of so taking him off (as the phrase goes). The idea of the individual is so vividly before him that he cannot help this imitation; and consequently his vocal muscles, those of featural expression, and those which govern the gestures, the gait, carriage, and demeanour—all obey the mental impression, without the intervention of any volitional action.

Let us now inquire into the distinction between automatic and volitional action. We have seen that in the several groups comprehended under the former, motion succeeds to impressions, without sensation or with sensation, to emotions, and to ideas; but that there is no indication in any of these instances of the self, the conscious ego, being the originator of the movements. The common statement is, that we will the action of certain muscles or groups of muscles, in order to execute our purposes. But this is an incorrect statement; for it is obvious that in childhood, and indeed at all ages, unless we have learned anatomy, we know nothing about the mechanism whereby we move our limbs. Nay, after we have acquired such knowledge, we cannot make use of it in the manner supposed. I cannot, by an effort of my will, cause the contraction of that muscle which is the chief agent in bending the elbow—yet that muscle may, in morbid spasm,

be thrown into single and separate action. But, will the bending of the arm, and it is done. In many of what we call voluntary movements, we do not even will the action of particular limbs. Thus, in learning to walk, the infant has no notion of limbs, of planting the foot on the ground, keeping one leg stiff, rotating the body on the hip-joint, &c. It only wishes to move to some place or person in view. The motions ensue upon the desire, guided by the subjective sensations of equilibrium, and by the objective sensations of vision.

The more we consider the subject, the more plain will it appear that the exercise of volition consists in maintaining an association between certain ideas, sensations, and motions; the individual self being conscious of its relation as the cause of those actions, and of its power to increase, or lessen, or interrupt, or arrest them. If we wish to analyse the process in any given case, we must be careful, for reasons which will soon appear, to select one that is not an habitual or mechanical action. In learning to play upon a musical instrument, there are many movements to be acquired which are quite new, and would, perhaps, never be required at any other conjuncture in our lives. Or to take a less uncommon case. You have to lift the third finger alone, while the others are kept flat on the keys of the piano. The master tells you to practise it,—and what do you do in practising it? You keep your mind on the end in view,—the raising this finger so reluctant to act alone, vehemently desiring to be successful, and sooner or later, if you are free from any physical defect, your ambition is realized. This little achievement seems a simple affair, but it is really rather a complex one. It is not the mere lifting of the finger, it is keeping the other two down; for the finger in question is raised by a muscle with tripartite tendon, of which two divisions go to the second and third fingers, and therefore the tendency is for all three to move together when the muscle is set in action. To prevent this, the muscles that place the first two fingers are put into action so as to antagonize the extensor and keep them down, while the action of that extensor is allowed to tell on the third only. But of all this the successful young lady is unconscious. She has only, by diligent application of her mind, kept the object steadily in view, and a wonderful association of muscles has done her bidding, she is unconscious how; she knows no more of the process than if she had called to her aid some of the fairies or genii of her nursery fables.

The process in volitional movement is well illustrated by what

takes place in imitating an instinctive action—as in acting or forcing a cough. We conceive the idea of the act of coughing with the will of producing the act; and this follows with more or less success according to the vividness of the conception, and the readiness with which in the individual ideagenous motions follow the idea. In one who has histrionic genius there is, besides the higher mental faculties, a quickness of response in the muscles to the ideas in the mind, as well as to the emotions.

But perhaps this subject may be further elucidated by considering what takes place in volitional efforts of thought. Much of our thinking is done mechanically—automatically—one thought suggesting another by the laws of casual association. But what is implied in such phrases as mental effort, application, undivided attention, painful abstraction of thought? There is a close analogy between this process and muscular exertion. They are analogous in the circumstance that they for the time engross our consciousness, that we feel a strain, an exertion, which, but for some ulterior object, we should be inclined to relax, and that after it is over we may be conscious of fatigue, or exhaustion.

If you watch a child who, under the stimulus of emulation, or the fear of punishment, has been laboriously conning a task but just within the reach of its faculties, you may mark in the countenance, the skin, the pulse, the whole demeanour, effects like those produced by excess of bodily exercise. In both cases there has been an undue consumption of force. Wherein consists this mental labour? It is the forcible bringing together and keeping together ideas or signs of ideas which have no natural tendency to cohere, or are not helped to cohere, by any other process than volitional effort. Take the instance of a child's committing to memory a rule of grammar, the meaning of which is altogether dark to him. I remember one, who before he was five years old, sat down to learn off the Latin Accidence (prompted by ambition—an elder sister having just been initiated into its mysteries), and he worked away at that luminous sentence—"A noun is the name of whatsoever thing or being we see or discourse of." Plain as this seems to us, it was to him only a series of words which had to be impressed on his mind, and remembered in the order in which they followed each other. And how did he achieve this wonderful acquirement? He read them over and over again—sometimes in silence—and then those cabalistic verbal signs were associated as visual

remembrances. He read them aloud, and certain tones were associated with them, reproductive of each other. The words contracted relationship, not only with the part of the page on which they stood, but with the part of the room where he sat, with the furniture near him, and with the emotions of which he was the subject, as hope and fear fluctuated in his anxious ambitious bosom.

At last the lesson was learned; that is, the words would come back into the mind in the series in which they had been seen in the book. They were no longer held together by mere sight and volitional attention, but the occurrence of the first brought the second, and the second the third, because they had now very often co-existed, or proximally succeeded each other; and they had come to be associated with the images of other visual things, the recurrence of which was easy, by virtue of the liveliness of the original impressions.

To *attend*, or perform the mental act of attention, is to keep before the consciousness, by an effort of the will, particular impressions or trains of thought, or muscular actions. As to sensation, impressions excite the consciousness, and become sensations when the consciousness is not too closely associated with some other impressions or thought, or when they are new or very vivid. It seems to be a law, that consciousness does not link itself with any impression frequently repeated, unless it be accompanied by a feeling of pleasure or pain, or associated with some strong emotion, or with a train of thought associated with such emotion (in common language, some interesting subject). The first time you sit down in a room close to a railway, and hear the roaring of a train, you think that it will arrest your attention every time it occurs, but when the novelty has ceased you cease to hear it. It is not associated with any emotion or interesting series of thought; it is the passing of a train and nothing more. Or suppose you are at a dinner party. There is an incessant clatter of knives and forks and changing dishes, tramp of servants, and hubbub of voices, and yet you hear nothing but the words of your friend beside you, who is engaging you in some interesting dialogue. The consciousness at that time coheres to your friend's speech, fastened by the attractive force of present emotions, and is not to be torn from it by mere sensory impressions, unless these come reinforced by the divellent affinities of stronger emotions, or unless a voice pitched in a higher key than the confused Babel around you compels attention by its novelty. But the laborious action of the will in attention consists in enforcing a coherence between

the consciousness and certain objects which are not bound to it by emotional interest.

But if there be labour or difficulty in this volitional effort, there is still more in that which has for its object the conjunction of past sensations or ideas to the exclusion of the objects of sense. Suppose a young person shut up in a room and set to write down his notion of the character of Alexander of Macedon, and suppose, if it be possible, that the youth has never taken any interest in that magnificent hero: to measure the efforts he has to make you must consider what objects would be most likely to present themselves to his consciousness were he not to endeavour to control his thoughts. The things in the room, furniture, prints, &c., or should there be nothing of interest within, then the view from the window; escaped from these temptations he has to resist the attractions of memory, some sport, or entertainment, or curious book, or some prospective pleasure. He has to keep before his consciousness the image of Alexander, and all the cluster of actions and sayings associated with that idea through books, lectures, &c. No difficult task; but he has to arrange and parcel these recollections in connection with certain qualities of Alexander's mind, and clothe them in appropriate language. These connections are not so spontaneous as the others, and require more volitional effort.

The effort in *recollection* consists in detaining before the consciousness some idea about which the wished for ideas will cluster by association. We cannot *will* their reproduction immediately, for, were they objects of volition, they would already be in the presence of the mind, and therefore need no summons. Do I wish to remember the name of some person whose image is in my mind's eye? I keep it there; my thoughts about him take the forms of place and time, each of these bringing a large cluster of associations, to some one or more of which the *name* so adheres that it at last is presented to my consciousness.

There is a great difference in the facility with which ideas are presented to the consciousness and that by which they are detained. Conjunction between ideas and the consciousness is greatly *assisted by the emotions*. An illustration will bring this before you immediately. The first time you gathered a violet you were in company with a friend. Long years afterwards you come into a room perfumed with violets which you do not see. The fragrance recalls the flower, its size, colour, form, &c. Those perceptions co-existed in the first instance. The

presence of the one has recalled the rest by the mere law of co-existence. The same law brings before your mind at the same time the friend who was with you; but he is associated with so many emotions that his image remains long after the violets and their perfume have faded from your sense and memory. Nay, you are so occupied with those remembrances that you may fall into a fit of abstraction, that is, be unconscious of anything but the ideas and sentiments which have thus been summoned to your consciousness. Thus you see the ideas and remembrances associated with emotions are not only before the consciousness, but are detained there; while those remembered sensations which had no other connection than that of co-existence and succession, passed away as soon as they appeared.

These remarks on attention will enable us to return to volitional motion. The will compels a conjunction between the idea of the movement to be executed and our consciousness. To the idea of the movement, conjoined with the wish to execute it, the nervo-muscular apparatus responds sooner or later, if it be within the compass of our organization. The action is much aided by the senses, and, in some cases, particularly by the muscular-sense. Indeed there is no voluntary action of which sensation does not form a link in the series of events. This is well seen in the act of prehension. In grasping a ball for the first time, my fingers obey my wish to close upon it. The degree of force with which they will close depends on the sensation which the ball gives to the nerves of touch, and the feeling of resistance afforded by the muscular sense,—that is, the nerves of sensation in the muscles. To hold the ball in my hand, I must either keep my attention fixed on the action, or the nerves of sensation must maintain the muscular action. If these nerves be paralysed the action must be guided by the attention and by sight. The following case, related by Sir Charles Bell, is a good example:—

"A mother, while nursing her infant, was seized with paralysis, attended with the loss of muscular power on one side of the body, and the loss of sensibility on the other. The surprising and, indeed, the alarming circumstance here was, that she could hold her child to her bosom with the arm which retained muscular power, only so long as she looked at the infant. If surrounding objects withdrew her attention from the state of her arm, the flexor muscles gradually relaxed, and the child was in danger of falling."—*Bell on the Hand*, p. 244.

These consensual changes have something secondarily automatic or reflex in their character, for although when I fix my attention on the

action, I am conscious of a sensation; yet when I am occupied with other subjects, as in talking, I have not the sensations, and yet the nerves of sensation are acting in concert with the nerves of motion, and maintaining the action. The sensational has been converted into a *reflex* action.

Next we may notice the connection between volitional action and sensation in the process of speaking or singing. We need not go back to babyhood, though the study of it is most interesting; but we will tax our mature consciousness for the supply of information on this subject. I am learning a new language. I wish to acquire the pronunciation of a new sound—say a German guttural. It is a volitional effort. I hear the sound—I fix my consciousness upon it; my vocal muscles, after a few trials, produce it. After a time no effort of volition is needful. Certain letters associated with the first hearing of the sound suggest the idea of the sound, and this the muscular action. The action of the muscles of the voice clearly, then, belongs to the sensational group.

Strictly volitional movements are those which are objects of mental attention, combined with the wish to execute them, and which are not performed but under such circumstances. They are thus distinguished from actions which, though coinciding with, and controllable by our will, are originated and maintained by processes independent of this mental principle.

We have now to inquire how these volitional movements, after a time, pass into the category of instinctive or automatic actions. In fact we are entering the domain of Habit—a field which, though appropriated especially to this discourse, we have had to approach by a circuitous and, I fear, tedious avenue.

Habitual motions are those which have been transmuted from volitional to instinctive,—which have become secondarily automatic,—which from having been compounded of will, idea, and sensation, have become merely sensational, and perhaps, even in some cases, purely reflex. The ego—the consciousness, which was the first mover, has been able to leave the transaction to its subordinate agents, while it is occupied with other actions, or with sensations and thoughts requiring its undivided attention. Of these many have been established in early life. In standing and walking we have examples of complicated series of muscular actions guided by the sensation of equilibrium, and becoming ultimately all but reflex, though originally prompted by the will. That

the will is originally concerned we see, not only by our observation of children learning to stand or walk, but also in adults in whom the apparatus has been weakened by illness or old age, and in whom the mechanism is no longer so self-acting as not to require that mental attention to the several stages of the process, in which volitional action consists.

Speech is another of the habitual or secondary automatic actions. In this process there is perception of sound as connected with some object of sight (as in the naming of a thing) and the wish to imitate the sound. The action of the vocal muscles is preceded by sensation, idea, and volition. But after the habit of speaking has been acquired, it becomes purely sensational or ideagenous without intervening volition, and is allied to the instincts.

I here take the liberty of quoting from a paper which I published many years ago:—

"The articulation of every word was once, perhaps, the result of effort, a voluntary exertion of the vocal organ to imitate a sound produced by another. But now it is enough for the word to occur to the mind, and the pronunciation follows, without any intermediate volition, merely because the idea and the action have been accustomed to the relation of antecedence and consequence.

"Again: I may use some word which I not only did not intend, but which I would much rather have avoided, as it may be personally offensive to the individual with whom I am conversing. This word, in all probability, will be found to be similar in sound to that which was present in my mind, but which was not expressed by my voice. The word was the product of a certain aggregation or series of vocal movements, which followed some initial movement common to it, and to that other series which properly belonged to the idea in the mind. This we conceive to be the meaning of what is commonly called a *lapsus linguæ*, and is very different from a malapropism: *the latter is a mistake of the mind, the former is a mistake of the muscles.* A similar error not unfrequently occurs in writing. A perfect master of orthography may commit a mistake of this kind; he may write, for instance, the adverb *there*, though the pronoun was in his mind, merely from an irregularity of muscular succession. The tracing of a word on paper is the result of a particular set of muscular movements; but words of very different meanings may have very similar sets, and even initially identical, as in the instance just mentioned; and hence the mistake arises. We have heard persons say that a bad pen would make them mis-spell; in such a case, the impediment offered by the pen causes an irregularity of the succession of the movements. But it may be asked, how is it that we sometimes utter or write a word no less dissimilar in sound and in symbolical characters than foreign to the subject discoursed of? The causation in this case is different; the error exists in the mind, and arises from our being occupied with more than one series of ideas; in which case an accidental exchange takes place between the series communicated and that which is retained. To a person engaged in writing

when others are talking around him, the accident is very likely to happen. Some word makes a particular impression on his mind and diverts him a moment from his previous train of thought; but his muscles continue to act, and follow the impulse of the word in question, as of any other that passes through his mind, and germane to the matter in hand.

"From what has been said, then, it is deducible that there are motions immediately consequent on ideas, in the same manner as others consequent on sensations and emotions; but we have not arranged the former in a separate class, because we are not aware of any evidence that *ideas* assume the relation of proximate causes to *motions*, except under the operation of the general law or principle which we have been engaged in illustrating, while sensations and emotions, on the contrary, manifestly produce their appropriate actions, without any reference whatever either to previous association or succession."—*Relations of Mind and Muscle.*

Such actions as standing, walking, speaking and handling, are the most primitive arts of life, belonging to man as a species, and contemplated as essential parts of his active existence, without which, indeed, he would be wanting in the outward characteristics of humanity. They correspond to actions which in the lower animals are all but coeval with birth, or which only require the complete development of the organism rather than any process of education. The young kid walks on the day of its birth. The bird does not fly when just out of its shell, because its wings are imperfect.

In these primitive arts, then, belonging to the whole race, there is a more ready and rapid conversion of volition into habit or instinct than in others which I now proceed to notice. These are the arts acquired by long education and practice, and which belong either to individual man originating them, or to individual man affected by his fellows. They are the manual, the domestic, the social, the fine arts. In all these arts the limbs have to respond to and work out an idea; and the connection must be frequently established and repeated by volitional efforts before the art becomes a habit. And yet we shall see here, again, the power of habit, and how, when it is more early acquired, it becomes allied to an instinct or an inspiration.

It is in these arts, indeed, that we may discover some of the most marked examples of habit,—recurring to that character of the principle which we gavo at the onset of this discourse, as the conversion of the casual or temporary into the fixed or permanent. For as the muscular actions have been engendered to meet circumstances which are not necessary to the life and endowments of the species; in other words, to subserve wants and answer to ideas which have arisen under particular

circumstances or in particular minds, so the conversion of them into actions that may occur without the maintenance of volitional supervision, illustrates very strongly the dominion of habit.

Such combinations of muscular actions as are effected in the sleight-of-hand tricks of a juggler, or in the scarcely less surprising dexterities of an accomplished player on the violin, may never before have transpired, and may never again transpire in any son of Adam, and yet in that individual they may have been so frequently produced, (*i.e.*, the will may have so often effected a junction between the idea, the sensations, and the motions,) that the succession is maintained without any mental attention. The player may talk to you while his hand is bringing out the music; one note suggests the next which has so often proximally succeeded to it, and with it comes the nervo-muscular action according to the principle of association which we have before adverted to. But in cases of this kind we may sometimes in our analysis fail to discover any link formed of an idea or a remembered sensation. Thus, one may begin to whistle without the faintest notion of what tune the muscles of the mouth and cheek will modulate. The muscular actions aggregate themselves into combinations and series unprompted by an idea, unguided by the will, nay, unsuggested by a sensation (for the motion precedes the note evolved), and arranged solely by the law of previous co-existence and proximal succession, repeated an adequate number of times. They are mechanical, automatic, reflex. Originally, perhaps, the order of events had been remembered;—musical sounds associated with certain words. The recurrence of the words brought the sounds, to which the vocal movement responded. But now the first movement sends an impression to the reflex centres, and these maintain the series independently of the sensational, ideagenous, and volitional centres. It is like the running off of a musical machine, except that the series may be deranged at any moment by an idea or emotion or sensation. Therefore it is most likely to be safe from interruption when the mind is in that blank condition to which the most sentient, sentimental, and intellectual are sometimes subject. Therefore there is a physiological meaning in the old line:—

"He whistled as he went for want of thought."

The habitual or *secondarily* automatic actions bear resemblance to the *primarily* automatic in the circumstance that when once established they are liable to derangement rather than assisted by mental attention.

Fix your mind on the process of breathing, and it becomes laborious or irregular,—think of the act of swallowing while you are performing it, as in taking a pill, and the action becomes spasmodic, convulsive, abortive. In like manner if you attend to your walking as you pass from one side of a drawing-room to another, it is ten to one but that your gait and carriage will be a series of jerking, swaying, rolling motions, in short, awkward, constrained, ungraceful. Something in such cases must be set down to emotional causes, such as the disturbing influence of anxiety. But from what we remarked before, you may be prepared to admit that the act of volitional attention is closely allied to emotional processes. And it will be found that in certain of the secondarily automatic *mental* operations, this disturbing influence is still more easily traceable.

The readiness with which these habitual movements are established, as I have already mentioned incidentally, is closely allied to natural aptitude or talent. It is far beyond dispute, that however great may be the power of education and practice, yet that men differ immensely from each other in original capability for particular arts. Men are *born* artizans and artists, as well as poets; for the former, whatever may be the mental requirements, there must, at all events, be an aptness of hand, a quickness of response in the muscles to the ideas in the mind—a readiness for the establishment of those series, and aggregations of complex co-ordinate movements, which, for their first institution require the repetition of volitional efforts, but which in one man require almost an indefinite number of repetitions, while in another a very few will suffice to convert them into habits. This, however (natural dexterity), is but the bare mechanical substratum of skill and art. Yet without it a man cannot excel, though his mental capability for the higher processes in the art be of transcendent excellence. He may have the most nimble apprehension, a memory the most retentive and accessible, the most refined and delicate sense of the beautiful, a power of rapidly combining and abstracting those qualities in natural objects, which, when reproduced, will faithfully and vividly represent the originals, an instinctive knowledge of that subtle symbolism whereby objects are made to evoke in other minds those sentiments which were inspired in the artist as *he* looked on nature, and with all this, a noble desire to make the æsthetical gratification minister, as their natural handmaid, to Virtue and Religion; he may have all these, and many more qualities necessary for the accomplished

artist, and yet they may only serve him for the appreciation of the achievements of others,—not because he wants "the vision and the faculty divine," but because the hand is not a defty servant of his thought. But when, indeed, the hand and the eye and the mind do come together, each with the highest qualities, compass, quickness, and co-ordination, then we have a Phidias, a Michael Angelo, a Raffaelle. Many like instances might be adduced; but I hasten to remark, in connection with this department of our subject, what indeed is well known to every one, that for the formation of many of those habitual co-ordinate actions nothing is needed but frequency of repetition. They argue no special fitness of organization (though, indeed, even in them a natural cleverness may be discernible), and merely instance the power of repetition. Such are the mechanical processes of every-day life,—the act of writing, the operations of the toilet, the dinner-table, &c.

But here the question naturally occurs, why should mere repetition dispense with volitional exertion? To answer this fully would require a long and abstruse discussion. I must content myself with a summary statement of what seems to me to be the explanation of the fact. The more the action of an organ is augmented the stronger it becomes, and its nutrition increases. This is clearly seen in the development of muscles called frequently into play. I would apply this fact by analogy to the nervous centres. The different nervous centres in the encephalon communicate with each other by commissural fibres. In volitional movements, the action of the commissures between the sensational or ideagenous centres and their related motor centres is excited in the first instance by the will. But the repetition of more or fewer of these incitements appear to suffice for the growth and development of the commissure to a degree of strength and activity adequate to the performance of its functions independently of the will. Thus the volitional action is converted into a habit.

The abnormal habits are curious, and perhaps less easy of analysis. They are those actions which subserve no apparent purpose, either as to the functions of the whole system, or to the will, or the emotions, or the ideas of the individual. What earthly end is answered by biting the nails, twitching the air, twirling the thumbs, rubbing the hands, kicking the heels, and various other singular and all but unaccountable human actions, which are designated in the vernacular as tricks

or fidgets? Why should a person under strong emotion exhibit such peculiarities of deportment as are attributed to Sir Jacob Kilmansegg on the morning of his daughter's christening?

"And Sir Jacob, the father, strutted and bowed,
And smiled to himself and laughed aloud,
To think of his heiress and daughter—
And then in his pockets he made a grope,
And then in the fulness of joy and hope,
Seem'd washing his hands with invisible soap
In imperceptible water."

Why was it that when a certain great statesman in the House of Commons was about to make a signal rhetorical effort, his friends were advertized of it by his mechanically rattling his watch-chain and seals for full half-an-hour before he rose? Why do little boys, in saying their lessons, go through sundry mysterious operations of buttoning and unbuttoning their jackets; and why do gentlemen, earnest in argumentation, wildly lay hands on the little implements of a neighbouring lady's work-table, and turn them to strange uses on the adjoining furniture? There must be a law for facts so common, and all but universal.

I believe that they are referable to two principles. One of them is the provision made in the nervous system for the concurrence of muscular action with deep thought and strong emotion. Consider how nearly all the emotions have their natural alliance (in the form of expression) with certain muscular actions in the features and the limbs, and how very important these are in the mutual communication of men in early states of society. Consider also how often some form of muscular action goes with thought; and again how common it is to accompany speech with gesticulation; and how in the more important acts of life thought and motion are going on together. In literary composition the action of writing is a natural accompaniment. If a man dictates it is ten to one but he will walk about the room while doing so, because it is natural for some muscular action to accompany profound thought.

But you may say that these considerations do not help us out of the difficulty. For speech and gesticulation being the accompaniments of thought and emotion, why should we add such unmeaning muscular actions as those which have been adverted to? We come then to the other principle, which is, that the motor centres are apt to elaborate

more force than is required, and which must be disposed of in some way. Now that there is such a thing as nerve-force cannot be doubted. We talk of force of attraction, of chemical force, of motive force, of electric force; and though none of these forces can be produced as entities, and may be only summary expressions of certain chains of phenomena considered in their causative order, there is as much reason for using the term nerve-force as any of the others. It is that principle of power which, generated in nervous tissue by virtue of the changes which this substance undergoes in its ultimate molecular nutrition (in the higher animals under the operation of blood-changes), stands in the relation of proximate cause to motion, sensation, and the material ministrations of thought. The common sense or consciousness of mankind attains to a very near recognition of this power, when it assigns the buoyant movements of childhood to an excess of vitality, and when a man says that he feels such a surplus of irritability or irritation in his system that he takes active exercise to get rid of it. We have seen how the nervous centres are brought into action simultaneously and co-ordinately. Now if there be great excitement in one (excitement means exalted vital action), there will, to a certain extent, be the same in others, more especially in those related. If the emotional centres are strongly excited, there will be a large elaboration of force in the motor centres, some of which force may be discharged in the appropriate featural expressions and gestures; but to expend the whole of it, strange movements and antics will very probably be performed. To let these have free play is a great relief to many persons, while to restrain them requires great self-command and discipline.

In sleep, although the centres of sensation are quiescent, there is often too much activity in the motional centres, and then the nerve-force goes off in a variety of irregular muscular actions, such as kicking, stretching, change of position, tossing off the bed-clothes, &c.

In sensation, in motion, and in thought, nerve-force is generated and consumed. The fatigue, nay the absolute bodily exhaustion, induced by excess in any of these functions is a proof of it. In persons of the nervous temperament there is at all times an amount of nervous energy produced beyond what is absolutely required for the performance of the normal functions of the brain. Hence it is in these persons that we see the most striking instances of the tricks which we

are now considering. Very remarkable is the tendency in some children. They wink their eyes, make strange contortions in their limbs, change their posture, shift the weight of the body from one foot to the other incessantly when answering the slightest question, and all from the excess of motor nerve-force generated concurrently with the little mental excitement. These movements sometimes occur in particular sets of muscles in preference to others, and then they are called habits.

But I cannot leave this part of the subject without remarking that there is good reason for the caution which has often been given, not to interfere too much with these nervous habits; for they are sometimes salutary outlets for morbid irritation. I know a young lady who, when her mind was unusually interested, had a habit of rubbing her forehead, and if this were prevented, either by moral or mechanical means, it seldom failed to induce threatenings of serious disorder in the brain. There are certain kinds of convulsive seizures which may be considered as discharges of nerve-force, like those of electric jars highly charged. Pardon me for giving you one more practical instance:— There are some persons whose brains, when highly excited, say, by a public entertainment, or an interesting conversation or argument, or even by having fallen into some engrossing train of thought, cannot pass readily into the normal condition. The elaboration of nerve-force continues. If they retire to rest they cannot sleep; they go on thinking, and feeling, and tossing about, or vividly dreaming, when they ought to be "mere clods of the valley." Now the best thing to prevent this is to take active muscular exercise before retiring, whereby the superabundant force is used up.

Habit as to Sensation.

On first considering the effects of habit in connection with sensation it would seem to be the reverse of what occurs in connection with motion. Habit, instead of increasing seems to lessen sensation. We speak of becoming too habituated to things to feel them. The contact of clothes with our skin is habitually disregarded, though, had the investiture been a new ceremony, we should not be able to forget them for an instant during the day. We sit in a room reading or talking while a time-piece, to the sound of which we are accustomed, strikes

the hours and the quarters, without hearing it. The inhabitants of miserable tenements in the worst parts of our towns (where sanitary matters are neglected to a degree that is a disgrace to civilization, and a dishonour to Christianity,) live unconscious of odours which strike those who have not been inured to this wretchedness with disgust and terror. The "common light of day" gives us no subjective sensation, no feeling in our eyes, unless we have been unusually excluded from it for a long time, and then it may be blinding.

After considering such facts as these, we remember on the other hand that education is known to quicken the senses, that the North American Indian is said by habit to see and hear sights and sounds which escape his more civilized brethren; and that the purchaser of tea can try forty or fifty sample-cups in succession, and make his selection of the best flavours with unerring accuracy; and that wine-tasters can, by practice, attain to the delicacy of discrimination which characterized those notable rivals vouched for by Sancho Panza, of whom, as you remember, one declared that the wine tasted of iron, and the other of leather, and each of whom was found to be correct when the cask had been drained to the bottom: for there lay an old cellar-key, with a thong attached to it.

These two sets of facts seem at first sight to contradict each other, but they do not really do so. We have seen that habit in reference to motion strengthens and gives independent power to a connection established in the first instance by volition. It will be found to be the same in sensation.

What is the process in sensation? An impression is made on a sentient nerve, and conveyed by it to the sensory ganglia, where it becomes connected with the Ego, and is then, and not till then, a sensation.

We have already been speaking of attention, and shown that impressions are presented to the consciousness by virtue of their novelty or vividness, and are detained or dismissed according as they are associated or not with emotions, or compulsorily associated by the will. It appears to be a law that a repeated impression ceases to become a sensatian when its novelty ceases. A different degree of vividness is in fact a new impression, and therefore comes under the law. The final cause of this arrangement is obvious. Were we at the mercy of all the impressions which are perpetually made upon us, were they all

converted into sensations, connected thought would be impossible. But the impression may have nothing of novelty, and yet its recurrence will always be followed by sensation, because it has been associated with an emotion. This effect of association is strikingly exemplified in sleep. Impressions of the most violent kind may be made, and yet the sleeper will not feel them if he has been accustomed to them, and not had them connected in his mind with some subject of interest. It is told by Dr. Carpenter, of a great naval officer, that he could sleep through the loudest noises on ship-board, but if any one whispered in his ear the word *signal* he was awake in an instant. So I know the case of a lady who sleeps profoundly during ordinary noises, but if her relative who is near her makes in breathing a sound which she has often known to be the precursor of an attack of illness, she wakes immediately. So also with the tick of an alarum.

In the sharpening of the senses by education and training, we again see the influence of the emotions, or of ideas associated with emotions. We look and listen, that is, we attend to sights and sounds, because there is an expectation of good to be received, or a fear of evil to be averted. Again we are said to acquire the habit of attending to certain classes of sensations. Here the emotional interest is more remote. The objects of sensation may be uninteresting, but we exert our volition to compel a coherence between the impressions and the consciousness; and the connection having been often repeated, and so once established, becomes permanent; the volitional becomes automatic. Habit supplants the will; and thus we have another illustration that the influence of this principle is exerted by virtue of association.

Habit would thus seem the offspring and afterwards the successor and representative of volition. But what is meant by a habit of inattention, a listless habit? Thus a person may fall into the habit of sitting at church and not listening to the service or the sermon. The use of the word in this manner is a metonymy. It is not the habit of not attending, but the habit of attending to your own thoughts in preference to those of the clergyman.

Everywhere in this subject we fall back on the principle of association. Everything in this world is interesting, or important, or influential, according as it is related with other things.

The repetition of volitional impulses gives increased strength to the related centres of motion, because these centres become active. The

repetition of impressions which are not taken up by the emotions or the will, and do not pass into sensations, will come to nothing. It is not that habit deadens the sensibility to the repeated impressions, but that the impressions ceasing to be linked with the emotions and the will, having in fact no associations with any thing else in the mental life, die away; or, indeed, never arrive at any thing but an abortive existence.

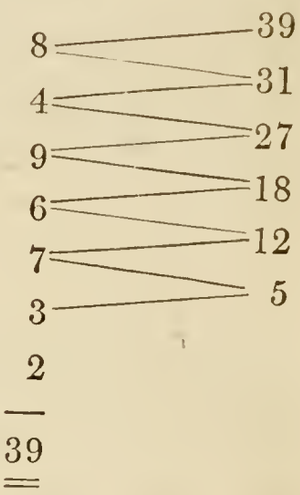
Habit as to Thought.

In the remarks preliminary to our consideration of volitional motion, I spoke of some of those mental processes which are enforced by the will in efforts of memory. There are others to which I can but very briefly advert, with a view to the prosecution of our immediate subject. Such is the compulsory contemplation of phenomena in a certain order or arrangement when we reason, whether inductively or deductively, or when we arrange, according to a certain shape or plan, those clusters of ideas and emotions which belong to fancy and imagination.

Congeries of ideas, or trains of thought, orignally associated or marshalled by volition, may, like the volitional movements, become automatic. The memory of compositions, or of narratives, or of arguments, once attained by efforts of the will, becomes automatic. Recollection passes in remembrance. Nay, like the analogous movements, it is apt to be deranged by mental attention. How often does a person find that the more he tries to remember something, the more he is baffled. He gives it up, talks of something else, and that which had been sought for in vain comes unbidden. The automatic process of association went on better when the consciousness was not fixed upon it.

Arithmetical calculations illustrate this principle. That 2 and 3 make 5, is at first committed to the memory by means of the will: after a few repetitions of these three figures the combination of the two first will bring the third mechanically, that is, 3 will add itself to 2, and bring 5 in its train, and so on with a long column of figures. Mr. Dugald Stewart adduces the case of an expert accountant running his eyes up a column of figures and arriving at the sum total, unconscious of the intermediate mental acts, as an instance of a succession of efforts of attention, so rapid as to have been forgotten. But there seems to me no need of presuming that of which there is no proof.

The numbers seen have so often been linked with their equivalents in the memory, that the latter recur passively and mechanically. Thus in consequence of long use and practice 2 and 3 cannot but suggest the idea 5, and 5 meeting 7 brings 12, and 12 meeting 6 brings 18, and with 18 added to 9, 27 links itself, and so on.



Thus the visual and the mental trains of figures interchange without any effort.

These associations have so often been compelled, that they now recur by necesssity. It is just as with the player on an instrument; the impulses in the centre of motion so often associated with the notes of music on the paper come without attention, though at one time their co-ordination was only effected by dint of the most laborious attention.

2
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39
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In reasoning, a like automatic process is traceable. The *ergo* fastens itself without effort to the premisses. The conclusion is self-evolved from the major premiss.

And the self-evolution of thought may be traced much further.—Ideas grow out of ideas, without our consciousness of the various stages of their mysterious genesis. The new production suddenly blossoms forth to the astonishment of its possessor, who finds himself all but unawares the maker of a grand discovery. Or, to vary the illustration, take the case of a writer of works of imagination. His mind has been stored with a vast assemblage of images, scenes, sentiments, and characters. In some auspicious moment, and sometimes unexpectedly, the scheme of a poem or fable unfolds itself before his mental eye; it is as if his mind up to that time had held all the scenes, incidents, characters and similies in a state of solution, and then by a happy conjunction of outward and inward agencies, the several elements of thought attach themselves to each other by their several elective affinities, and crystallize into their appropriate shapes and colours of beauty and grandeur.*

The secondarily automatic processes of thought, induced by habit,

* The whole subject of the automatic action of the brain in intellectual processes is treated with great ability and originality in Dr. Carpenter's Chapter on the Cerebrum and its Functions—("Principles of Human Physiology," fourth edition). The reflex action of the brain with reference to motion had previously been expounded in a highly ingenious paper by Dr. Laycock, read before the British Association, September, 1844.

closely resemble those which are instinctive. To the latter class belong the intuitive beliefs. To believe the information of our senses, as that the sun moves, is an instinct. Such also is the expectation of like consequents from like antecedents, or cause and effect. Such also is the confident belief in the existence of outward things—the separation of the *ego* and *non-ego*. Such also the reference of the existence of things and of ourselves to an unseen Power. These, like other instincts, are variously susceptible of modification from subsequent experience. But in all these cases the ideas have not been brought together by volitional efforts; they have an innate tendency to cohere. Indeed, they can hardly occur separately. The existence of the one necessarily involves that of the other. They, in fact, grow together. But the ideas which have only been casually clustered, or knit together by the workmanship of volition, may ultimately cohere as strongly. The force of habit will thus equal that of instinct; a faulty train of reasoning may acquire the strength of an original instinctive perception; an oft-told lie becomes a truth, and a superstition may be as hard to break asunder as the simplest and most primitive religion. Education thus vies with intuition, and habit becomes second nature.

These habits of thought, like habits of action, when once acquired are not easily discontinued. They are like grooves in which the mind has been accustomed to slide; if well contrived and fitted, and in a right direction, they are of incalculable value. If not, they are injurious, they prevent the mind from moving in better ordered and more truthward tracks. In the progress of life it becomes more and more difficult to alter our habits. The grooves have worn deeper and deeper, and the volition is less and less willing to trace or carve new ones. It is ridiculous, I should better say it is mortifying to human nature to watch the awkward and futile efforts of a mind to throw off its long formed habits. Take it out of these prepossessions, and prejudices, and bigotries, and how uneasy and jolting are its movements! for such habits are ruts rather than grooves, which though they allow no rapid motion of the heavy carriage that follows them yet cannot be escaped. In attempting to quarter the road the movements are made without confidence, and the wheels are perpetually threatening to slip into the old tracks with a crash that endangers the safety of the whole vehicle.

It would be interesting, but time will not allow us, to pass on to an investigation of habit in reference to the emotions and moral senti-

ments. But the same law will be found to hold good in that department as in those which we have so imperfectly treated.

I must conclude with a few words on the *final cause* of habit.—

As to habits of action, it is obvious that the great use they serve is the economy of time. What would man have accomplished by the end of his life had it been needful for him to attend to his movements in standing, walking, and using his hands and fingers? What progress would thought make were speakers to be thinking of the sounds they utter, and to be consciously directing and adjusting their vocal apparatus? And where would be the literature of the world were the mind compelled to pass from its sublime contemplations to the muscular actions which guide the movements of the pen? But the more we consider the subject, whether as to the development of those actions which characterize the species, or as to those acquired accomplishments and dexterities which range from the humblest handicrafts to the loftiest triumphs of the imaginative arts, the more we shall be struck by the gradually increasing subordination and subjugation of the mechanical processes to the more exalted faculties of the mind.

This view would at first, perhaps, make us inquire whether, as these volitional movements which we have been considering ultimately become automatic, it would not have enlarged the capacities of man, had they *begun* as instincts, just as some of them really are found in the lower animals, instead of going through so long a process of evolution and education? A foolish question, as every question must be, which proposes an arrangement of events different from what is obviously a part of the plan of God's universe. Take away the struggling striving will even from these corporeal actions; remove effort, resolution, the conscious initiation of action, perseverance, training, and education, and what is human life reduced to? Gigantic as man's powers become, he was not intended to spring from the earth in their full equipment. Survey him in his infancy, childhood, youth, adolescence, and manhood, and while you become convinced that his gradual acquirements bring him a multitude of enjoyments, as well as difficulties and disasters, you cannot but see that what is evolving in him bears a strict correlation to the powers, emotions, sentiments and virtuous actions of those, who having arrived at the maturity of *their* powers, are to help *him*, to whom *he* is bound, as they to *him*, by ties which make the affinities of the human family infinitely transcend the transitory parental instincts and gregarious associations of the lower

animals; for *they* live and grow up almost as they were born, devoid of progress, not one whit wiser or more skilful than the first pair that issued from Noah's ark, living for themselves only, or only under a blind impulse providing for another succession. But man having consciously and with pain and labour and peril acquired his endowments, lives them over again by teaching them to his offspring; and apart from that happier existence to which he knows that he is destined in other worlds, feels that here too he has a kind of immortality; that as he has inherited knowledge, and virtue, and power, he too has to transmit them; that his life and its achievements have a mortal metempsychosis, a translation into the enlarging attributes and brightening destinies of his children, and of unborn generations, and in the production of works which, like Milton, he knows that posterity will not willingly let die, and in the elaboration of systems which, like Bacon, he bequeaths with his fame to the next ages; in this realizing anticipation of a posthumous renown he survives his own death, passing by his living consciousness far beyond the narrow bounds affixed to his mere corporeal duration.

But while habit, as we have seen, is so useful in abridging labour, in economizing time, in preserving order, and method, and coherence in our thoughts, and in making the practice of virtue and religion easier to us, still it imposes upon us no inevitable compulsion. It is not the blind necessity of an instinct. It is our own fault if we are enslaved instead of being merely assisted by habit. Human agency ought to be able to assert its freedom in this as in every other department of thought and action. The habit should be like a steed, so well broken that though the will may have thrown the reins on its neck, while otherwise occupied, it can in a moment gather them up and come to a sudden halt.

Habit, we have seen, is at once the product and the sign of previous volition. And though in certain muscular actions belonging to the species it closely resembles instinct, yet as to the thoughts and actions of individual men it is widely different. For as the will of every man has its own peculiar form and colour, making an important part of his individuality, so his habits will have their own character and freedom of growth. Those who are attached to him will regard with partiality the very habits which have grown out of his peculiarities. The singularity of his gestures, the eccentricities of his gait, carriage, and demeanour, the oddity of his featural expression, the tone of his voice,

his ways and his whims, his fancies and his philosophies, his predilections and prejudices, the whole complexion of his life, and the whole colour of his conduct—his goings out and his comings in, his risings up and his lyings down,—all are valued, because they give us more vividly the express image of him who is endeared to us for his own individual sake.

But while there is the utmost latitude for the formation and the relinquishment of habit according to the will and humour of the individual, the habit which has grown out of a strong character will inevitably impress itself on others. A strong character does not depend on the intellect, but on the original strength of the will, and on the habits which it has originated. It is one whose actions have sprung out of its own individual will. The very limitation of the intellectual vision may strengthen the volition by the repetition of its objects and by the iteration of its correlative actions. This self-possessed, self-contained, self-originating power, is sure to affect others. It is a new centre of motion to those who are ever ready to derive their impulses from without, rather than from their own life.

Thus we see the two elements in social life antagonizing each other, and yet bringing out the most important results;—the potential freedom of every individual—and the unfelt compulsion of a passive imitation. And were any argument needful beyond what has been so often urged by moralists and divines as to the formation of habits which may become so powerful either for good or evil, in the *individual* character, it is to be found in the consideration that in our influence on others we are responsible not only for what we directly do or directly teach, but also for that insensible operation of our characters which, in proportion as they are strengthened by habit, are in that same proportion sustained in their capability of impressing and moulding to their likeness, the wills, the affections, the thoughts, and the actions of our fellow men.

While these sheets have been passing through the press, the popular mind has been wonderfully excited and occupied by the Table-movement. As this rage is likely to be even more ephemeral than these pages, it may be worth while to record very briefly the phenomenon, and to offer what appears to be the rational explanation of it. Three or four, or more persons, stand or sit round a table with their

fingers slightly resting upon it, the little fingers of each individual resting on those of his neighbours. After patiently waiting in expectation for fifteen or twenty minutes, rarely sooner, one of the company observes that the table begins to move, and forthwith it either moves in a rotatory or in a straightforward direction, according to the shape of the table and the disposition of its legs; and the operators move with it. In one case which I have heard of, the table having been rickety, and its top more mobile than its supports, the movement consisted in a swaying backwards and forwards of the former part, while the latter remained steadfast.

It will be inconsistent with the gravity of the future historian of our era to depict the scenes of which this movement was the centre; else one could wish that posterity might not be defrauded of some amusement, together with the satisfaction of a conscious superiority, while contemplating this mania of their ancestors. Yet they would scarcely believe that in many of the club-houses of London, comprising among their members some of the most distinguished personages of the country, might have been seen groups of earnest and excited elderly gentlemen solemnly trotting round tables in the performance of this mysterious rotation, and showing by their countenances that they were convinced that themselves and the table were the subjects of a new development of force which was about to revolutionize the physical philosophy of the age, and to indicate the long-sought-for bridge which spans the dark gulf between living and inanimate matter. Alas, for their philosophical aspirations!—

> Usque adeo res humanas vis abdita quædam
> Obterit.

To a person dispassionately observing the phenomenon for the first time it surely would naturally occur that, as the things in immediate contact were, on the one hand, inert (according to common philosophy) matter, and, on the other, a number of bodies made up of nerves, muscles, bones, &c.,—in short, an apparatus especially designed for imparting motion to surrounding objects, the movement of the table was somehow dependent on the action of the said instruments of motion. He is met, however, by an assertion on the part of the operators that they communicated no motion to the table, that they only kept their hands in contact with it, and that it moved by virtue of the electricity passing out of their bodies. A magnificent leap to a conclusion! But the observer is not so agile in his inferences. He

examines the facts attentively, and ventures to think that it is superfluous to invent any new causes for the explanation of a fact which, though curious, falls within some of those categories of motion which have been the topics of the forgoing lecture. The movements of the hands or fingers laid on the table that give an impulse to it are not volitional, but secondarily automatic; partly ideagenous—that is, following the idea or expectation in the mind; partly consensual, through the muscular sense, or simply reflex. A certain time is required in order that there may be the necessary unity of expectation and unity in the direction of the unconscious operation. In many cases, the table, though very light and mobile, will not stir at all. In these instances the operators are not all impressed by the same idea, or the hands of some are more under the influence of the will than of the automatic agency. Marvellous stories are told of the table moving on one or two legs only; or, we should rather say, that the fact is told as if it were marvellous, when the simple explanation is, that the motive force is stronger on one side of the table than of the other.

It is perhaps worth while to remark, that in addition to the automatic sources of motion referred to, there are two others; one, that of the insensible resting of the hands on the table when the operators are fatigued; the other, and a not unimportant source, the predominance of the flexors over the extensors. The fingers are kept in contact only with the table, that is, are prevented from pressing upon the table, by the volitional action of the extensors. A very short time suffices for the withdrawal of this volitional exertion, and then the flexors act by their tonic contraction. The multiplication of this through forty or fifty fingers will be enough to cause in the table sundry creakings and irregular movements, very exciting to the imaginations of the experimenters, whose minds unconsciously surrender themselves to the idea of a movement in the table, and then a series of actions in the right direction follows almost immediately as a matter of course.

CRIMINAL RESPONSIBILITY IN RELATION TO INSANITY.

I COMMENCE this paper by saying, that I propose to discuss the criminal responsibility of the insane under such aspects only as are necessarily presented to all practitioners of medicine. The consideration of the subject under all its bearings would be more appropriately undertaken by those who have made the phenomena of insanity their especial study, and the care of the insane the main business of their lives. I need not remark, that our Branch* has the honour of numbering among its members some very eminent representatives of this class of observers and practitioners, one of whom, in his presidential address last year, imparted to us some highly valuable information on points connected with his particular experience; and another has promised us a paper for this evening, to which my own may, perhaps, serve as a very slight introduction. The only other remark that I have to make in the way of preface is, that this paper was written just after the trial and conviction of Townley the murderer, and before the various discussions had appeared in journals and newspapers, which, could I have foreseen them, would very probably have deterred me from bringing before the Society a subject which, however important, has become trite and all but exhausted.

Among medical writers and medical witnesses in courts of law, there have been great differences of opinion as to what constitutes a man irresponsible for a criminal act. But these differences may be arranged under two or three heads.

* This Paper was read before the Bath and Bristol Branch of the British Medical Association at Clifton in 1869.—[Ed.]

1. There are those who think it must be proved, that the person under consideration was the subject of a delusion, an insane belief, the result of a morbidly erroneous action of the comparing faculty, and that this delusion originated the act for which the person is brought to trial.

2. There are those who would not limit irresponsibility to so narrow an issue. They say, that there may be no evidence of any particular delusion; but that the man before he committed the act manifested so much disorder in his feelings, disposition, character, and general conduct, that he ought to be held irresponsible.

3. A third class hold that, if a man were one of whom it might be said that he was in any way insane, whether in judgment, or in feeling, or in propensities, no matter whether or not there be any evidence of connection between the act and the special form of mental derangement, still the mere proof of diseased mind ought to excuse the person from the legal consequences of his act, even though there might be evidence of an adequate motive for the act; the theory in this view being that, when it is once admitted that a man's mind is in any way unsound, no one can deny that this unsoundness may have extended to the feelings, motives, judgment, power of self-control, &c., so as to put the act out of the category of crime. In other words, the holders of this view do not require that, in order to exempt from responsibility, the delusion, or the known morbid state of the emotions and moral sentiments, should have been mixed up with the crime.

The view which the law takes of this subject is briefly this. It is a mistake, according to Judge Maule, to speak of the "plea of insanity." It is not that a man is tried and convicted of a crime, and then that a plea against judgment is presented on the ground of insanity, like the plea of a general pardon or a previous acquittal. The issue is, whether, say in the case of murder, the man committed the act wilfully and maliciously. The prosecutor alleges that he did. The prisoner, in his defence, gives evidence that wilfulness or malice cannot be predicated of his act, because of the unsoundness of his mind.

Now, the stress of the evidence is all on this point. The jury have to decide whether the prisoner's act was wilful and malicious. The judge explains to them that he committed it wilfully and maliciously unless he was in such a condition of mind at the time as not to know that he was doing wrong; or, as some put it, not capable of knowing the consequences of his act. It has been held by some great lawyers

that, if the person committing the act know that it is illegal, he is responsible for the act. But the Judges, in their answers to questions put to them some years ago by the House of Lords, in the case of Macnaughten, for the solution of this point, decided that the jury have to find whether the prisoner acted wilfully, and knew that he was doing wrong, and thereby incurring the punishment of the law; or, as it might otherwise be expressed, that the law cannot allow acquittal, unless it be proved that the person was disabled by mental disease from knowing that his act was wrong. I think that, as the lawyers use the word "*wilfully*" as well as "*maliciously*," their proviso ought to include those cases in which men, being driven by irresistible and motiveless impulse to crime (as in homicidal insanity), cannot be said to have committed the crime wilfully.

Some have contended that it is unreasonable to ask a jury to solve problems so difficult as right and wrong. But, after all, it is only a common-sense view that is required of the jury; it is not a metaphysical subtlety. The law is founded upon right and wrong—principles which people decide upon and act upon in the common affairs of life; and it is presumed that most persons know that such principles are the foundation of the law.* The great difficulty, as I have hinted, which the jurors have to meet, is that of determining whether the prisoner was disabled by mental disease from knowing that his act was wrong. Medical witnesses are summoned to give evidence on this very point. One, as we have already seen, would say that it is enough to prove the unsoundness of mind, because this may vitiate, more or less, all its judgments, feelings, or motives. Another, with more limitation, would say that the man's insanity bore particularly on his feelings, disposition, emotions, and motives to action; and, therefore, that it was specially liable to lead to an act of violence; and that as our feelings, in our soundest condition, affect our judgment, so, when morbidly perverted, they are particularly liable to warp it and disable a man from perceiving the quality of his act. A third will maintain that there was a special delusion which led to the act in question, and made it of a quality claiming irresponsibility. But this argument of delusion must be accompanied by proof of its emanating from a diseased mind; for, without this qualification, the strange opinions

* For a luminous statement of the legal aspect of this subject, I beg to refer to a paper by Mr. Fitzjames Stephen, published in Part I. of the *Transactions* of the Juridical Society.

held by sane men might exculpate any criminal act. Again, others have argued with considerable justice, that you may grant the delusion, and that the act flowed from it, but yet it does not follow that the man did not know his act to be wrong. The lords put this question to the fourteen judges. "If a person," ask the lords, "under an insane delusion as to existing facts, commits an offence in consequence thereof, is he thereby excused?" The judges answer: "Assuming that he labours under such partial delusion only, and is not in other respects insane, we think he must be considered in the same situation as to responsibility, as if the facts with respect to which the delusion exists were real."

This judgment leaves it open to the jury to take in the delusion as a part of the evidence as to the prisoner's mental condition, though the delusion itself does not justify the act. In the case of Hadfield, his delusion consisted in his belief that he was our Lord; that his death was necessary for the salvation of mankind; and that, though he ought not to kill himself, yet for firing at George III. he would be hanged, and so the world would be saved. It is clear, here, that he did not feel that, in acting on his delusion, he was doing wrong, but quite the reverse. In Bellingham's case, he was under the delusion that Mr. Windham had injured him; and, having mistaken (which any sane person might have done) Mr. Perceval for Mr. Windham, Bellingham shot him. There was no evidence to prove that he did not know that he was doing wrong, so he was convicted; for, if Mr. Windham had indeed injured him, and Bellingham in revenge had shot him, he (Bellingham) would, of course, have been convicted. The feeling that followed upon the delusion or upon the real fact, and which feeling brought about the murder, was the same in either case. But still it might have been argued, that such a delusion was so absurd as to indicate great unsoundness of mind; and the jury in such a case would have to settle in their own minds, whether it was enough to disable the subject of it from knowing that his act was wrong.

Cases are not uncommon in which persons have been afflicted with a false impression that they heard voices maligning, denouncing, and threatening them. Under such an impression, they have taken loaded pistols and rushed out of their houses in search of the imaginary offenders. Supposing that such a person had met some one on the spot, and, under the influence of rage at the fancied insult, killed the unoffending individual, was the insane man answerable for his action?

A man under any violent passion does not consider much the consequences of his act; and even had the insane man been really insulted in this way, it would not justify his act. In such a case, the medical witness may give an opinion that so strong a delusion indicated a diseased brain, and that the man was disabled by the state of his brain from knowing at the time that his act was wrong; or that he was for the time so mastered by the delusion as to have lost all power of self-control; so that, though his act was malicious, it was not wilful.

If the delusion proved to exist in a case had nothing to do with the act, the quality of the act must be judged on other evidence. In Buranelli's case, it was pretty clear that this delusion had nothing to do with his crime; and that there was sufficient evidence of malicious motive. But there were eminent psychopathologists who thought that, independently of those delusions, the prisoner presented other evidence of unsoundness of mind sufficient to make him irresponsible. In a recent case (Townley's), the prisoner was held responsible because he knew the consequences of his act, and he was actuated by evil passion, and he premeditated the crime. But a question might be raised whether he knew that he was doing wrong, seeing that he held the notion that an engagement made the lady his property, and that he might dispose of her as he liked. Though I should have joined in the verdict of "guilty" on the whole evidence, I confess that there is a difficulty in distinguishing what one might call a strange eccentric individual belief or crotchet from what another would call an insane belief in this case. But, seeing that the object of punishment is prevention, it would be dangerous to admit that a young lady's life might be left to the mercy of a lover's crotchets.

It may be worth while to dwell on the instances of delusion to which I have just alluded. In all but that of Buranelli the delusion was mixed up with the act. In Hadfield's case the delusion was not only an utterly wild and absurd belief, but it also affected his sense of the morality of his act, and his act had little or no personal passion mixed up with it. In Bellingham's case the delusion, though concerned in the act, did not affect the right or wrong of the act, and natural passion entered largely into it. In the hearer of imaginary voices, the delusion *per se* again might not justify the act (for it is wrong to shoot a man for abusing you). In Townley's case, his particular notion did affect his view of the quality of his act in a pre-

eminent degree, but it was combined with violent personal feeling. And the delusion, if so to be called rather than an eccentric notion, was not enough to prove a diseased state of mind.*

What is delusion or insane belief? Let us take one or two examples. Suppose a man proposes to you to form a company for draining the Mediterranean Sea, and making of the recovered land a magnificent cherry-orchard; this proposal is so contrary to all your notions of what is probable or practicable, that you pronounce it at once to be insane. Another comes to you, and avers that he can produce a change in your body by administering to you decillionths of a drug, and persists even when you have explained to him the numerical meaning of a decillionth, which is equivalent to *reductio ad absurdum*. This is quite as opposed to your notions of what is possible or practicable as the former notion, but do you call it an insane belief? A third tells you that he believes that a *clairvoyante* girl can read a writing placed on the epigastrium, or form a judgment of the bodily and mental condition hundreds of miles away, by means of a lock of hair. Is this an insane belief? and if insane, is it so insane as to argue disease of the mind which entertains it? A fourth tells you that he was justified in killing his betrothed, because a marriage engagement gives a man absolute possession of the woman, and the right to deal with her life. There is nothing more insane in this belief than in the others which I have noticed. The first and the fourth are the most dangerous; the one to the property of the speculator; the other to the life of the affianced lady. The second and third may be only dangerous in the way of superseding more reasonable and salutary methods of medical investigation and treatment.

I think that the more we consider delusions, the more surely we shall come to the opinion that a delusion, like a symptom of a disease, must be viewed in connection with other mental facts before we can arrive at a correct notion of the unsoundness of the mind, and the correlative irresponsibility of its owner; and it will be found that different species of insanity, like the groups of diseases in our nosological classifications, run into each other. Not the less, however, do we recognise the value of such classification. There is a class of cases in

* Since the above was written, it has been made highly probable by the investigation of this case by the special commission, that the alleged notion was an after thought set up in vindication of the crime. See a very able medico-legal commentary on Townley's case, entitled "Insanity and Crime," by the editors of the *Journal of Mental Science*.

which delusions or intellectual aberrations are the prominent phenomena; but they are rarely, if ever, unattended by an abnormal condition of the emotions and feelings. There is another class in which the feelings and sentiments which constitute disposition, temper, and character, and which incite and govern actions, are disordered without marked disturbance of the understanding (the moral insanity of Prichard, the *manie sans delire* of Pinel); but if we examine them carefully, we may often discover indications of impaired or disordered judgment. And the same may be said of the group characterised by violent disturbance of the lower propensities, while mania may present in the same person manifestations of all the forms of derangements which characterise the above groups.

Our excellent associate Dr. Davey, in an interesting pamphlet on *The Law of Lunacy in Relation to Crime*, gives it as the result of his observation and experience, that mental disorder generally, and especially that which is likely to be mixed up with criminal charges, has its beginning, and betokens itself mainly, in the emotions and propensities.

To return to the principal question of this paper. How far does mental unsoundness affect a man's responsibility? Perhaps we may get a little additional light by looking at the question from a fresh standing ground. Instead of looking at it from the side of insanity, let us regard it from that of the rights, liberties, and interests of society. Was the criminal under trial a free agent, enjoying all the advantages and privileges of a person at large? If he was, can the law distinguish between him and other members of society? Law is a social contrivance for the preservation of life and property. As at present constituted, it cannot without difficulty enter nicely into the motives and antecedents of crime. It views the acts of men as they are done, and deals with them according to its prescriptions. The legal judge is not the maker and searcher of hearts. It is hard for him to decide what motives or passions are irresistible; or what temptation was unduly yielded to, what bias was pardonable. If the biography of every criminal could be fully unfolded, if his original organisation could be laid bare, if the outward conditions of his moral life could be described in detail, showing how every influence that should educe and nourish the moral sense, was wanting, while all that could feed and foster and develope the tendency to evil, was working upon him from the cradle up to manhood, it might appear that, on a righteous and

equitable survey of the agencies and instincts to which the criminal had been subject, he was perhaps a less culpable person than nine-tenths of the members of the court at whose bar he is arraigned—persons whose propensities to commit legal offences have been held in check by, or received no encouragement from education, position, habits, customs, conventions, and worldly interest. Much of temptation is hidden under social propriety. And, were hearts to be unveiled, perhaps more might appear than might be pardonable, even among the most respectable members of society. But such adjudications are not for human tribunals, at least in the present imperfect state of society. Men must be tried by their acts; and the known consequences of certain acts are the preventives to crime set up by society in its own defence. Society does severe things. It is hard, though perhaps unavoidable, to send brave, ignorant peasants to incalculable suffering, and with the certainty of a large percentage of deaths, in fighting battles for the defence of pestilent territories acquired on most questionable titles. It is hard to imprison, and it ought to have been felt very hard (in a former state of our penal code) to hang men for crimes prompted by the most primitive of human needs. "You are not hanged," a humane judge might say, "for stealing a sheep in behalf of your craving stomach and famishing children, but you are hanged in order that henceforth sheep may not be stolen. Your fate must conform to the necessities of society."

But though society cannot nicely balance and allow for the natural incentives to vice and for the faults of education, may it not allow for morbid aberrations of judgment or for morbid propensities? Unquestionably, when they amount to a certain degree. But what is that degree? This question we have already in part considered. But let us ask another question. Why was the criminal at large? Why was he in the enjoyment of the privileges of society, if he were not answerable to the law which protects these privileges? This question points out to our minds a test that may be a help to us as medical witnesses, whatever may be the value of it to the public, or to the deliberations of a court. If we are considering whether a prisoner is responsible or not for his act, let us ask ourselves whether the facts testifying to his unsoundness of mind were such as would have justified us in certifying him as a person fit to be confined. And if we can satisfy ourselves that we should not have judged him to be a person who could be entrusted with his liberty, we may safely pronounce him

irresponsible for his actions. But if we must have left him at large, then he must be treated as a free agent, and one who was not disabled by mental disorder from knowing that his act was wrong.

I think my fellow-members will give due consideration to this suggestion. And were it brought before the attention of the public as likely to be carried into practice, it might probably have an indirectly beneficial operation on those unfortunate persons about whom is the question. Were the partially insane to know that so long as they have liberty they are answerable to the law, I believe that this knowledge would lead them to that self-restraint which is the object of deterrent penalties. And as to the public, they would take more heed of those individuals who, by reason of their unsoundness of mind, are dangerous possessors of liberty. The test would not only diminish the odium or obloquy which at present is so often attached to those who place such persons under control, but it would impel the friends of such persons to the performance of a duty from which it is often natural to shrink. But here comes a difficulty which must be familiar to all who have had to deal with these debateable cases. There is no friend or relation willing to incur the responsibility and the expense of consigning the case to an asylum. What is to be done? This difficulty points to a great public want, which will, I trust, be some day supplied. I mean the appointment of public medico-legal functionaries, whose business it shall be to investigate and take the responsibility of determining upon, and providing for, the seclusion of the cases alluded to. I think it would eventually appear that it is better, nay, that it is fiscally and economically preferable to deposit a brain-sick man in a hospital for the insane, where he may be *cured* as well as kept out of the way of harm to himself or others, than to allow him to remain at large till he has committed some crime which will cause him in one case to be maintained at the public expense as a convict or prisoner for life, or in another to be executed as a doubtful criminal.

There are two obstacles, but not, I think, insuperable, against the practical utility of the criterion which I have proposed. One is presented by such cases of madness as begin abruptly, and are, indeed, first betokened by the very act for which the perpetrator is under trial. Such are the cases of impulsive mania, called Phonomania, Pyromania, and Kleptomania. Now, I think, if these cases are studied carefully, it will be seen that they are so flagrant as to prevent any question about them; that, although the person affected manifested no such

indications of mental unsoundness previously to the act as would have justified any one in depriving him of liberty, yet the act itself was so motiveless, so obviously the result of an irresistible impulse, as to take it out of the legal category either of wilfulness or of malice.

Another difficulty would be offered in cases in which a delusion, though long held, has only been manifested by the act itself. If it be plain that the delusion did exist at the time of the act, then we may consider whether, had we known of such delusion, we should have deprived the person of his liberty. But if the delusion would not have been strong enough to justify such interference, then let the criminal be held responsible.

But here I beg to remark that, in debating these questions of responsibility, we are taken somewhat beyond our strictly medical functions. Sometimes we willingly, almost officiously, pass out of our province; but oftener we are dragged out of it. I do not think, that it is our business to say what is moral, much less legal, irresponsibility. It might be well for us to resolve and agree to say no more than what we know as medical practitioners. Let us declare the man to be, in our judgment, sane or insane; just as, in examining for an insurance office, we pronounce the candidate to be sound or unsound in body. Having declared him to be unsound in mind, let moralists and legal judges settle the question whether he was responsible for his actions. For my own part, I do not hold that, in the abstract, unsoundness of mind should, necessarily and in all cases, exempt from culpability. Every case must be examined on its own merits; and the questions on which the individual case must turn are, as it seems to me, legal and moral, not medical. We have burthens enough on our minds; enough of difficult problems to solve; and it is hard to have forced on us those which do not belong to our calling.

But whether we like it or not, we shall still have these troublesome questions pressed upon our consideration. Was the prisoner insane to such a degree as to take his act out of the category of malice and wilfulness? Was he ignorant that he was doing wrong and breaking the law? Had his disorder deprived him of the power of self-control? I repeat what I have said, that, in determining these points, we study the whole man; and consider whether, had we known his history, we should have allowed him to be in possession of his liberty. And we must remember that, while it is our duty, on the one hand, to save an irresponsible man from punishment, we must not, on the other, push our

theories as to human actions so far as to weaken that check which punishment gives to crime; ever bearing in mind that, while one man may be so overmastered by morbid propensity, and another by wilfully indulged passion, either of which may set all fear of punishment at defiance, there are vast numbers of persons with feeble moral sense, moderate passions, and exposed to strong temptations, whose premeditation of crime is arrested by the dread of punishment. For, putting aside the fear of criminal punishment, are we not all aware that even minor penalties are strongly operative? What would be the safety of virtue and what of integrity, were there no such punishment as social loss of caste and social dishonour?

In conclusion, and to gather up the more important practical points of this paper. It will be our duty to inquire in any case: 1. As to delusions, whether they were of so gross a nature as in themselves to argue a diseased state of the understanding; or whether, though of an insulated nature, and not involving the whole mind, they had a direct bearing on the crime; or whether they were mixed up with morbid emotions and sentiments. 2. As to cases without manifest delusions, whether the state of the emotions and moral feelings was so perverted, either with reference to the ordinary standard, or with reference to what was the patient's former temper and character, as to indicate a morbid condition, that condition telling in particular on the power of self-control. In distinguishing such cases, it will be a help to view the inordinate emotion in relation to the object which excited it—as in the common cases of revenge, hate, jealousy, and cupidity; and to consider the proportion between the passion and its provocation. 3. As to the impulsive forms of mania, these ought not to be admitted but on the strongest evidence. But luckily, in such cases, the evidence is usually very convincing; or if not so to the merely legal mind, it is conclusive to those who have any practical acquaintance with the great variety of the forms which mental disorder can assume.

THE PUBLIC ESTIMATE OF MEDICINE.

THERE are two kinds of common place: one which consists in repeating a sentiment which has been frequently expressed before; the other, in saying something which, though it may not have been said before, has been in every one's mind, and indeed has to every one seemed to be so obvious as not to need communication. To the latter head you cannot fail to refer the remark which I am now about to make, and which I cannot avoid making, namely, that the present meeting of the British Medical Association* is held under what may be called trying circumstances; trying to the stout hearts, trying to the *amour proper* of this locality; for it is the first meeting held in the provinces since the metropolitan meeting. The events of that meeting are too fresh in the recollection of those who partook of its splendour and its enjoyments, and too well known by testimony to those who like myself were so unfortunate as to have been absent from it, for me to think of telling how it was attended, how it was conducted, and how it was presided over; nor will I uselessly spend time in deprecating a comparison of that meeting with what we are now inaugurating. We trust to your clemency and generosity; and, as the temporary representative of the profession in this place, I humbly beg to offer the Association a hearty welcome to our ancient city and neighbourhood.

The distinguished founder of this Association is reported to have said last year in London, when the proposal was made that the next

* This Paper was read as the President's Address at the meeting of the British Medical Association in Bristol, 1863.—Ed.

meeting should take place in Bristol, that he entertained a very favourable recollection of a former meeting in this city. I shall be content, and my fellow members in this district will be content, if this second visit of the Association shall be considered as agreeable to the body generally as was the former. Of this happy result I should despair, were I to think only of the terrible gaps which Time has made in our ranks since then. Thirty years, one of the fleeting generations of men, have passed away since that time. But it is not with a public association as with a private circle of friends. In the latter case there is nothing to be done but to close up the vacant spaces, draw nearer together, and, with the scattered remnant of our company, do battle as best we may against Time and Fate. But it is not so with a public body, which has no essential and inevitable mortality. It has the vital principle of royalty—"the king is dead—long live the king!" Or, in a better comparison, we might say that it has the vitality of organic structures. If its nutrition be healthy, as fast as one set of molecules die away others take their places, and fulfil their functions. Three decades of years are gone since the former meeting of the Association in this city; and these three decades, which witnessed the passing away of so many who brought honour to our profession, witnessed also the production of discoveries and writings, the influence of which must last as long as the science and art of medicine endure. Of the truth of this remark, ample proofs might be culled from those annual retrospects the origination of which is due to this Association; and, perhaps, it has been not the least important part of the work which the Association has incited. I have not time to particularise, but if any one wished to mark the progress made during this period of history, it would be enough to take up systematic treatises on pathology and medicine published before 1833, and to compare them with those at present in the hands of students. To pass from Alison, Eliotson, and Andral, to Williams, Watson, Paget, and Virchow, would be to pass over a space filled with an immense accumulation of new researches and valuable discoveries.

When this Association met in 1833, Marshall Hall had not undertaken, or at least had not made known to the world, those experimental inquiries which, whatever controversies they begot as to the absolute originality of his views, yet gave a new impulse and a new character to the whole science of neurology. At that time the anatomy of tissues was only such as Andral, and Béclard, and Meckel had left it, that is,

at the utmost limit to which the dissection of that time could advance it; for then the microscope had not been brought in to aid the scalpel. The names now so familiar to us, of Vogel, Hasse, Bowman, Henle, Kölliker, were then unknown. At that time the blood as a seat of disease was only adverted to in a faint whisper of suspicion. But no minute researches had been made as to the relative proportions of fibrin, globules, and albumen in various diseases; much less had the microscope been employed in aiding the analysis. The cellular theory of the growth of vegetable and animal structures had not then been broached; and the names of Schleiden and Schwan had not reached this country; nor, indeed, were their observations promulgated in Germany till long after the date we are looking at.

Dr. Bright's great discovery had not attracted general attention, though his *Medical Reports* appeared in 1827. I find no allusion to it in the earliest annals of this Association. It was not till a few years afterwards that albuminuria became a prominent object to pathological inquirers, though we now regard it as not only momentous in itself, but also as having given a great impulse to our modern humoral pathology. It was long after that time that our improved methods of treating phthisis began; uterine pathology was in its infancy; and, however much those who have practised new methods of treatment in the pelvic diseases of women may have been carried away by their sanguine expectations, it must, on a calm and candid review of the subject, be allowed that great improvements have been made since the time when chronic disorders of the female organs were mostly included under scirrhus, fibrous tumour, uterine neuralgia, leucorrhœa, &c. Surgery, especially conservative surgery, can number great achievements that had been previously undreamed of. And there has been one therapeutical movement which did not begin till long after the epoch we are considering, I mean the use of anæsthetics by inhalation. Were there no other discovery to stand out on the medical annals of the last thirty years than the anodyne use of ether and chloroform, it would be enough to make the whole suffering world, through unborn generations, look back to the intervening era with admiration and gratitude.

I do not profess to take even the most superficial glance at the history of our science and art: I have only alluded to it as prefatory to a question which may, perhaps, be a suitable theme for our consideration at the present time. A review of the progress of medicine,

and an impartial estimate of the facts which it surveyed, would be sufficient, one would imagine, to render this question nugatory:—How has the art of medicine advanced in the opinion of the public? Surely enough must be known by persons beyond the pale of the profession as to the researches to which powerful and industrious minds have been devoted; enough must be known to increase the confidence of the public in the art which is the ultimate object of those researches. But we will not now consider how the public mind ought reasonably to regard the progress of medicine, but let us ask, What is the fact? How is it regarded?

In all times there have been a large proportion of the public who have traditionally adhered to medicine, though they have not escaped the risk of being occasionally carried away by some quackery of the hour. And the relation of this part of the public has remained much the same, except that occasional secessions from it have been made on a larger scale during the time we have been contemplating than at any previous period; the causes of which I need not inquire into. On the other hand, a portion of the public have at all times entertained a certain amount of distrust of the resources of medicine. And from the satirists and epigrammists of various times might be gathered a curious collection of opinions, by no means complimentary to medical practitioners. There is much of contingent matter in our science and art by the very necessity of things, and the gross results are what men judge by. They do not know the processes; they cannot measure the difficulties, but they can estimate a success or a failure. Lord Bacon says: "Almost all other arts and sciences are judged by acts or masterpieces, as I may term them, and not by the successes and events. The lawyer is judged by the virtue of his pleading, and not by the issue of the cause. The master of the ship is judged by directing his course aright, and not by the fortune of the voyage. But the physician, and perhaps the politician, hath no particular acts demonstrative of his ability, but is judged most by the event; which is ever but as it is taken; for who can tell, if a patient die or recover, or if a state be preserved or ruined, whether it be art or accident? And therefore many times the impostor is prized, and the man of virtue taxed. Nay, we see the weakness and credulity of men is such, as they will often prefer a mountebank or witch before a learned physician." *(Advancement of Learning.)*

It is not surprising then, that, according as a happy or an unsuc-

cessful issue has chanced to impress the minds of men, our profession has become the subject of extravagant eulogy, or of abuse and derision; for the feelings of the observers are by the very nature of the case highly excited on the subject, and to a degree that both warps their judgment and gives emphasis to their expressions. There are on the one side surprise, and delight, and thankfulness at life saved or anguish soothed; and on the other side disappointment, grief, despair, when a life is unexpectedly extinguished, or when pain goes on baffling every effort made to quell it. Such contrasts of feelings in different persons, or alternations of them in the same person, must naturally belong more or less to the public.

But, while one can understand and make the utmost allowance for the disappointment often felt by those who have sought the help of medical art, one might expect, if they know anything of the amount of study and labour which has been bestowed upon medical science, and if they consider how the individual practitioner whom they consult has made it the main business of his life, one might expect them to say to themselves:—"Well, whatever may be the shortcomings of medicine, it is plain that well-informed practitioners must, at all events, know far more of the matter than we do. If they know but little, we know less; if they can give us but little help, whence can we get more?"

And this, indeed, does represent the feelings of a large number of persons; but with others there is an under-current of doubt and distrust, even when they yield a sort of external confidence to medicine. And of this scepticism, were it of an enlightened, inquiring form, we ought by no means to complain. It is obvious that a great deal of it within the last quarter of a century has been caused by the extensive circulation of works which have made it a special object to infuse doubt and dissatisfaction into the public mind as to the claims of medical science and art, as hitherto taught and practised, and to favour the introduction of new methods and systems. But over and above this, there are other causes which, though individually slight, have by their co-operation done a great deal towards unsettling general faith. Such are the seeming success that has resulted in certain cases from the abandonment of medical treatment, and trusting entirely to unassisted nature; the apparent benefit derived from methods of treatment disapproved by regular practitioners, and adopted by patients who take the law into their own hands; the prosperous results ensuing on the seditious and treasonable advice of their friends, in contravention of

the authority and injunctions of the medical adviser; the conflicting opinions and directions of practitioners themselves, not merely as one man differs from another in drawing practical corollaries from the same established truths, or in applying them in individual cases, but as to the whole system and process of cure, as, for instance, whether reduction or support should be the ruling object; the alleged prevalence of fashions of treatment among the faculty, so that the same methods and remedies seem to be applied to a vast variety of seemingly dissimilar disorders; and the unwise and rash admissions of eminent men as to some uncertainty and inefficacy of medical science and art, admissions which may be fittingly and honestly called unwise and rash, because the qualifications are not appended or cannot be understood; such admissions torn, as it were, from their context, being easily garbled and turned to mischievous purpose against the real interests of mankind, as well as of the medical profession. Upon each of these heads we might expatiate at some length did time allow us; but it cannot be doubted that they severally and conjointly operate in lessening the confidence which is due to medicine.

The scepticism of educated men out of our profession may be somewhat judged of by an extract from an article in the *Saturday Review* for October 11, 1862, on "Physiology and Medicine;" also from one in the *London Review* for January 24, 1863, entitled "Doctors."

"It has been a convenient doctrine to set down the success of dissenting medicine to the general want of scientific instruction, and to an ignorant impatience of disease among the unreasonable mass of mankind, prompting them to have recourse to whatever irregular short cut might be offered for escape from bodily suffering. But in this, as in some other matters, men in general are not such fools as wise professors think them. Cold water and hot air, nay, even such coarse specifics as those of Morrison and Holloway, have not recruited their votaries exclusively amongst the ignorant and credulous. The plain truth is, that people have followed quacks because they have not found in the doctrines or the practice of the regular profession reasonable ground for confidence. Even those who knew nothing of the numerous revolutions that over and over again upset the prevailing doctrines as to the nature of disease and remedial action, have seen that there could be little certainty about a system which changes all its outward practices every ten or twenty years. If bleeding, calomel, starving, stimulants, warm rooms, open windows, have each been tried in turn, and, as it seems, without any marked advantage one over the other in effecting cures, it was not surprising that sceptics should doubt the inspiration of the oracle whose utterances were found to be so changing. Those who examined further, and discovered that the doctrines which were successively invoked to authorise each new system of treatment rested on arbitrary assumptions, not demonstrated, nor, for the most part, capable of demonstration, began to suspect, for the most part, that the

difference between regular medicine and quackery was not so profound as they had been used to believe. Both appeared to be in the dark as to first principles, and to appeal for support to empirical evidence. After analysing all that medical science could say in the great majority of cases of disease, the only reason to be given why you should swallow a given drug was the fact that many others, who seemed to be affected in a way similar to yourself, had taken the same drug and had survived the dose. The doctor, often uncertain of the nature of your disease, was quite ignorant of the cause of it. He had no evidence as to the action of his drug, or even whether it acted at all upon the cause of disease; and lastly, he had no certainty that the drug would affect you in the same manner as others who had taken it. The very utmost he could urge was a belief, more or less probable, that the same drug had been serviceable in cases presumed to be similar. Was there any essential difference between his process of reasoning and that of the honest quack, who, by a nearly similar process, had worked himself into a belief in the virtues of a specific?"

The writer in the *London Review* asks:—

"But can any one at this moment seriously declare that there is such a thing as a science of medicine? What there is is this. There are a few facts—a very few—distinctly known, and beyond the reach of controversy; and the number of them increases but slowly, if it increases sensibly at all. There is a pharmacopœia of drugs, about the use of which no three men agree completely, and about which, whatever agreement there is, is derived from simple empiricism. There is a vast amount of chemical research, which appears to bring more physiological difficulties to light than it serves to explain, and passes by a number of organic laws to which it is powerless to afford the slightest clue. It may be urged that all true science is founded on empiricism. So it is; but does any true science end with it? Can the doctors point to any one new law of their profession which they have laid down from the consideration of general principles, whether those general principles have been derived from practice or not?"

I cannot forbear adding another short quotation from the same article, because of the compliment offered to my surgical brethren. After remarking on the rapid progress of the science of farming, the writer is so good as to say,—

"The practice of surgery has made great steps in a still shorter period, and has discovered in chloroform a source of blessing to the human race, which will compare with any since the invention of steam. The legitimate gratitude of mankind is attested by the fact that there is not a single novel or drama of modern times in which a practising surgeon plays the part of a fool."

I quote from these journals, not because they have any special authority in relation to the subjects which we are considering, but because from the well known ability and learning of their conductors and contributors, they may be held to represent the higher culture of our people. It will have been noticed that these adverse criticisms on medicine include two principal charges:—1st. That it is not a true

science; and 2nd. That the practice consists of mere empirical processes, that is, processes that have been ascertained, or only thought, to be useful in the cure of diseases, but which have not been founded on any real knowledge of the mode in which they act beneficially.

Now, What is strictly a science? Is it not an account of phenomena, representing accurately their arrangement in space, and their order in time;—an account which classifies them as occurring in certain groups to which names have been affixed, names that, to persons duly instructed, recall the collection of facts;—an account which, from a great multitude of complex qualities and events, selects and gives prominence to those which are essential to the collection as distinguished from the accidental, and which discriminates, out of successive phenomena, those which are only occasionally, from those which are invariably, antecedent; an account which enables an observer to read the past and the future in the present, that is, to tell what must have preceded the phenomena under observation, and to state certainties, or high probabilities, as to the future; an account which enables an observer, from facts presented to his senses or reported to him as the subjective sensations of others, to say what changes have occurred or are going on in processes beyond the reach of direct perception? Now, if such an account of phenomena be not entitled to the designation of a science, I do not know what is. Yet such is medicine; and there is not one of my hearers, I will venture to say, who will not be ready to own from his own knowledge, often tested, often leaned upon in great crises, that the description I have so briefly sketched rather understates than overestimates that scientific observation and registration of phenomena on which our pathology is constructed, and which guides us in our recognition of the causes of diseases, and our expectations as to their course and issue.

To the other allegation, that medicine, as an art, is merely empirical, it is a sufficient answer that the art is, for the most part, founded on and directed by the science to which I have adverted. To say that it is a mere bundle of traditions, shows so profound an ignorance that it must excite extreme wonder in the mind of anyone who has even only the most superficial acquaintance with therapeutics. One is at a loss to account for the origin of so strange a delusion in the minds of these disparagers of medical art. One source however may, perhaps, be traced to the misrepresentations which are unhappily to be found in writings where one would have least expected them. I regret to con-

fess that there have been writers on our art, who, in their anxiety to impress what they consider some all-important principle of treatment, and which has an exaggerated importance in their eyes, either because it has something of novelty or because they have taken a distinguished part in its recognition or recommendation, speak of other principles as valueless, or hypothetical, or erroneous. Other writers again, who, from practical inaptitude, have incurred much disappointment in the exercise of medical art, have, instead of recognising the real cause of their failures, been ready to fancy that the art itself is of little worth, and that the sick might as well be left to the natural tendencies to cure. All periods of medical history might furnish specimens of this kind of detractors; men driven by disappointment into disaffection, and whose treasonable words have been caught up by some of the unthinking or malicious multitude.

If a teacher of medicine really wishes the public to be rightly informed as to the character of medical art, he should endeavour to set forth the fact, which all my hearers will admit to be true, that the difference between the scientific physician and the empiric consists in this, that the former does not rest his art on arbitrary assumptions, nor on the mere observation of specific remedies. The rational physician endeavours to learn first of all the order of events in the healthy organ and its functions, the nature and causes of the disturbance of this order in which disease consists, and then the events which precede the return to a healthy state; and from these various sources of information, together with a knowledge, which has been acquired in various ways, of agents which influence the natural actions of the living body, he endeavours to help or hasten the processes which repair, and to restrain those which are hurtful.

Surely that kind of knowledge deserves to be characterised as scientific, which enables a physician to determine, from a combination of direct and inferential signs, that there is a collection of fluid in one pleura, and so unhesitatingly that he requests the surgeon to plunge a trocar into the chest; or which pronounces that a seemingly mechanical closure of the larynx is caused by the pressure of a tumour within the chest, exerted on a nerve which animates the muscular fibres at the opening of the glottis; or which can declare one case of paralysis to be caused by a clot of blood in the right or left *corpus striatum*, and another to be caused by disorganisation of a portion of the spinal cord. I mention these instances as some of the least uncommon.

If this be not scientific medicine, it would be difficult to say what could be so called. Obviously there is much yet to be learned. But I suppose that this remark may be applied to every science and art. Ours is not the only science which has attained to more proximate than ultimate principles. It may be true, for instance, that as to the operation of medicines we only know that one increases or arrests certain actions in the intestines, another in the kidneys, another in the brain, another in the heart, another in the lungs, another in the uterus; and that we do not know why substances which reach the organs through the blood, should exert a preferential action on one organ rather than on another. Jalap may have an elective affinity for the intestine, opium for the whole encephalon, aconite for the sensory ganglia, strychnine for the spinal cord, ergot of rye for the uterus; and this may be all that we can at present say of these well known relations. But when the chemist announces that sulphuric acid prefers potass to magnesia, and that silver prefers chlorine to nitric acid, &c., is he twitted with the limitation of his knowledge, and put into the same category with the empirical alchemist, because he cannot explain the cause of those elective affinities?

There is no more prevalent mistake, as to the practice of medicine, than the idea alluded to in one of the extracts which I have read to you; namely, that our art consists chiefly in a blind administration of specifics. Now, you know very well that in an enormous majority of instances drugs are given in order to produce some well known physiological effect, that is, a change in degree or kind of some function or functions, which change has been known, when effected in other cases, to abate or remove the disordered state of functions of which the patient is the subject. Belladonna is prescribed to a person in a paroxysm of asthma, not because it is a specific for that disorder, but because it is known to diminish muscular contraction, the excess of which in the fibres of the bronchial tubes makes the spasm of asthma. Elaterium is administered to an ascitic patient, not because some one suffering like disease has been better after taking it, but because that substance drains a large quantity of serum from the mucous surface of the intestines; both reason and experience having proved, in numberless instances, that abdominal dropsy disappears by absorption after the action of powerful hydragogues, just as effusions in the pleura disappear after blisters.

The professors of rational medicine may differ in their explanations

of phenomena so complex, intricate, and changeable as those of disease; and they may have marked preferences for various instruments and methods of cure; and they may often change their opinions under the influence of new observations and discoveries. The growing disposition among the more enlightened may be to withhold the more violent procedures, those which interfere most artificially with natural processes, and to study with more and more care the natural tendencies to cure, and the natural tendencies to dissolution, and to make it the aim of their art to play off the conservative against the destructive tendencies. And in doing this they may, as I have said, differ greatly in their procedures; and some of their measures may be taken up and laid aside, and taken up again with various degrees of favour, owing, as I believe, not so much to the fluctuations of medical opinion, as to the variations of the subject matter; that is, the changing character of diseases, the changing constitutions of men, operated upon by the changing series of meteorological agencies, of social customs, and of personal habits.

Is it not unreasonable, not to say ungenerous, to fasten on the professor of medical art a reproach that belongs less or more to all human arts? Are mistakes and uncertainties confined to medicine? Can constant and unerring procedures be claimed for, I will not say agriculture, horticulture, and the breeding of animals, since these, like medicine, have to do with organic nature; but for arts which profess to be founded on calculations of the invariable relations of measure and number, on rigid observation of invariable antecedents and consequents? Are engineers never out in their calculations—never beaten in their undertakings? Do their tunnels never fall in? Are their railways never undermined by springs, or swept away by tides? Have their ships never proved all but incapable of launching, from having been built upon a mistake as to the proportionate antagonism of friction and gravitation? Are they agreed as to their methods? They do not seem to be able to decide even the best form of a gun-barrel. Yet, they have only brute matter to deal with—matter, ponderable and measureable—with quantitative proportions known and acted upon, and machines that may be stopped and set to work at will. They have not to discover and rectify faults in machinery while still in motion; no perplexities are thrown into their problems by such incalculable agencies as nerve-force, vital chemistry, cell-growth, and the ever-shifting phenomena of human individuality, the uncertainties of human

sensibility, the perturbations of emotion and passion, the caprices of humour and temper, the fickle purpose, the wavering will, and all those contrarieties of man's constitution which make him ever the same, and yet not the same, and which, operative enough as they are in health, become a hundredfold more prominent in disease and more embarrassing, because they must be excused, and often can neither be reproved nor reasoned with.

I confess that I do not see how the art of medicine can ever take its right place in public estimation, till the public mind has acquired the requisite knowledge and the requisite cultivation of its reasoning powers to judge of it, for both of these are really needed. Knowledge alone will not suffice; for, if it could, we should be at a loss to account for cases which occur every now and then, in which men who have undergone a certain amount of medical training, and are possessed of an average amount of medical knowledge, have not only declared their disbelief in medical science, as taught in our schools, but have espoused some of the foolish theories and practices which have been set up against it. Such persons illustrate the uselessness or even mischievousness of knowledge, unless regulated by logic, and, I may add, by common sense. But on the other hand, mere logic and common sense will not be sufficient without the data on which they should work. It is simply want of knowledge, which explains the disparaging terms in which our art is sometimes spoken of, as we have seen, by men of high intellectual culture. We must also admit that the respect which it receives from the majority of well-educated persons is due, not so much to actual knowledge, as to conventional acquiescence in the claims of a learned profession, and to the presumption that able, vigorous, and conscientious minds cannot have given their best thoughts and hardest labour to the elucidation of a certain class of natural phenomena, without having arrived at some definite truths and some sound principles of action. For, in judging of medical theories and medical practice, it is ever to be borne in mind that, with a very few exceptions, they have not been devised and inculcated by men withdrawn from the outward world, and absorbed in dreamy abstract meditation. They are not the excogitations of the solitary recluse who sits in his cell, painfully weaving the web of thought from his own interior, "toiling out his own cocoon." But whatever their real worth may be, they are at least founded on a long and patient observation of nature. Therefore, a candid and intelligent bystander may reasonably admit that

such study cannot be profitless. Let a human mind, moderately well prepared, be set in front of the aspects and processes of nature, steadily enough and long enough, and it cannot but receive an impression more or less faithfully representing the facts. There must be an image on the mind; but, as in the work of the photographer, the definiteness of the delineation, and the exactness of the shading, will depend on the care and skill with which the plate has been prepared and handled. If the able and intelligent men, who sometimes speak slightingly of medical science, would but consider that there *must* be a nexus between the different parts of nature; that there is a necessary pre-established correlation between the phenomenal world and the percipient and reflective powers of man, they could scarcely fail to see that it is an absurdity, and almost a blasphemy against the constitution of the universe, to maintain that some of the grandest and finest minds God ever made, had, over long series of years, been engaged in laborious contemplation, and study, and experimental inquisition of those facts which we call disease, and morbific agents and remedies, and that their honest endeavours had been vain and profitless. It would be tantamount to saying that man, who was born to live by the sweat of his brow, might plough, and harrow, and sow, in a kindly soil, and that, as the result of his labours, there would be nothing to reap but tares and thistles.

As to the unthinking public and the airy satirists, we can afford and consent to excuse the one, and to smile at the other; but from the serious and well-instructed members of the community we expect a more reasonable consideration of this subject.

Now, if we desired to enable those who are outside of the profession to form an estimate of the amount and the kind of labour performed and endured by our brethren, we should not, for the immediate purpose in view, take them to those spheres of arduous exertion where men are engaged in the duties of practitioners. But to judge whether the professors, and teachers, and learners of medical science and art put themselves in the way of acquiring such knowledge as may best fit them for the fulfilment of the ends of their profession, I should desire to take the inquirer first into our medical schools, and point out the pains taken in teaching and learning the grammar of the art in the work of the dissecting-room, the laboratory, and the museum. I would then advise him to resort to the lecture-rooms, and hear how patiently, and often eloquently, the results of hard scientific investi-

gations and profound reasoning are expounded; and then to the hospital clinique, where the actual sensible facts of morbid nature are at once presented, explained, tracked, and commented upon for the instruction of students. Then I would take him to the private studios, where experimental philosophers are extorting the secrets of nature from nature's own works, by the scalpel, the test-tube, the balance, and the microscope; often labouring, month after month, year after year, baffled but not beaten, still toiling on, and even when partially successful waiting till results have been obtained so sure and unquestionable as to warrant them in undertaking the responsibility of promulgating their observations and conclusions. And then I would have him attend the meetings at which those results are announced, and watch the eager and joyful welcome with which a real addition to our stock of truths, to our practical resources, is hailed, and what jealousy and distrust attend hasty conclusions and questionable inventions. And finally, I would persuade him to spend a few days in our libraries and reading-rooms, and point out to him the shelves containing Transactions of Societies, Reports of Hospitals, and Annual Retrospects, and tell him that there he may find some satisfactory evidence of the amount of intelligence, research, and conscientious endeavour expended in building the art of medicine on firm scientific foundations.

He will thus find proof enough that the rules of the inductive philosophy have been followed, whether or not they have ended in that which its great regenerator announced as one of its chief aims, "the relief of man's estate." He will find that the facts have at least been drawn from nature, however they may have been arranged; and that our science does not derive its inspiration from one or two *dicta*, which are not philosophic truths, but merely strong and rather coarse antithetical expressions of some aspects under which certain phenomena may be viewed; and that it does not seek to curry favour with the uninformed by telling them that they are competent without study to judge of its merits. Its teaching appeals for appreciation to those who are engaged in like pursuits, and who are the only qualified judges of the worth of such labours.

Should our supposed inquirer take the trouble of doing what we have suggested, we can fancy that he might say:—"Now that I see on how rational a basis your art is founded; now that I am impressed with the thorough going exertion devoted to the study of that wonderful piece of workmanship which you profess to repair and keep in order;

now that I see with what skill you have unravelled the texture of the organs even to their ultimate molecules, fixed the functions and modes of working of the organs, and are learning more and more every day of the composition of the blood and of that vital chemistry that governs its relations at once to the tissues which it feeds and to the forces which it evolves; now that I know something of the researches into the operation of those external agents which are ever drawing organisms into life, maintaining their health, driving them into disease, and working their disintegration and death, whether by slowly sapping processes or by specific malignity, or through those mysterious influences whereby epidemics even yet overcome or evade you; now that I can take some slight measure of the vast stock of observations on the actual changes which disease makes in the structures, and on the order of the phenomena in dynamical interruptions and aberrations; some notion of what has been done by sagacious insight and toilsome comparison towards recognising during life those perilous processes which in other cases have left the ruin and ravage which your necroscopy has so painfully traced and so accurately recorded; now that I know how rigidly, nay sceptically, you have tested the worth of alleged specifics, or general remedies, or methods of cure; now that I have some faint idea of what your science has done and what it still aspires to do, I marvel that it does not command universal respect and confidence—not the superstitious reverence which is given to an authority the limits of which are lost in a cloud of mystery, but the intelligent deference which may be reasonably yielded to superior knowledge and superior resources."

Now here we have to repress the enthusiasm of the imaginary inquirer, excited as he is by his recent studies and acquirements. He must be reminded that the information of which he has just become posssessed, is precisely of that kind which the public generally cannot acquire. We only wish, and it is not an unreasonable wish, that literary gentlemen who address the public upon medicine in journals which, from the ability with which they are conducted, naturally and deservedly carry a great weight of authority, would prepare themselves for this particular work by a little study of the subject. It is not fair to content themselves with a hasty glance at books so rash, however honest in intention, as Sir John Forbes's "*Nature and Art in the Cure of Disease,*" or so one-sided as a recent "*History of Medicine;*" much less to allow themselves to be influenced by the disparaging statements

of writers who are trying to devise new systems in replacement of what they persuade themselves have become old and effete. These dreamers build their airy castles on ruins no less airy and fanciful. The buildings which they mistake for ruins are really substantial and impregnable fortresses.

But while we maintain that there is a solid scientific foundation for medicine, we do not wish to ignore the difficulties of the art—difficulties depending on the exceeding complexity of the phenomena to be dealt with. So great is this complexity, that nothing surprises me more than that enlightened physicians should sometimes attempt an extreme simplicity in their aims. Good Heavens! Does the working of the human machinery turn upon one or two springs or wheels, which are all that are to be handled? The great variety of chemical elements in the solids and liquids; the diversity of the organs and their component textures; the separate and peculiar endowment of the different parts; the high probability that many a nervous fibril which at present looks homogenous or identical in structure with other fibrils, has its own peculiar life and function; these and many like considerations should warn us against attempting a simplicity for which Nature gives us neither pattern nor warrant. Had she only one or two forces or principles of action in the body, we might be content to pursue methods only eliminative, evacuative, or revulsive, or stimulative, or restorative, or sedative; but as it is not so, we will pursue all of these and more, if we can find them, and we will not disdain to use specifics if we light on them, though we should prefer to know the rationale of their operation.

Of the difficulties of the art, there is one which will always present itself even to the most highly educated practitioners; namely, the individual personality. They may be masters of the genus and species *homo;* they may be learned in all his varieties, his races, his variations with climate, and land, and province, and town; his modification by civilisation, by birth, by breeding, by intellectual occupation, by trade and calling, by wealth and poverty, by labour and leisure; but they have still to recognise the individual man. There he is with his own physiognomy and make and build, the set of his head, the squaring of his shoulders, the curve of his back, the planting of his foot. He walks to the consultation-table, he turns round in his bed, puts out his tongue like no one else. He is John or he is Thomas; and he is no other. And his inward man is no less his own and of no

other. His heart and his lungs and his liver, in the infinite variety of nature, are his own no less than his face. He may behave under the most common disease as no one else does; and the most ordinary remedies may affect him in a peculiar manner. He may have the apex of one lung just touched with tubercles, and he may die in three months. Or one lung may be full of them, and the other half-full, and he may live three years or more. He may be kept awake by opium, and sent to sleep by coffee, and so on. But here, as in so much else that belongs to Medicine, it is but too easy to make over-statements. The differences of individuality must not be exaggerated; or we may have to infer that every son of Adam requires an Art of Medicine altogether for himself—for his own peculiar use. If the similarity between men and men, and between their relations to other existences, did not prevail enormously over the differences, there could be no general rules to guide the conduct of man towards his fellows. Men could not be fed or trained, or taught, or governed, or healed. It is enough to bear in mind, that there is so much of individuality as must constitute one of those difficulties of the Art, which those beyond the pale of the profession can very inadequately appreciate.

But nothing more strongly denotes the sagacity of the practitioner, than the quickness with which he apprehends and measures the special requirements of the individual man by help of what he observes, and by what he is told of his patient. Of like value is the tact which enables him to decide that, although of two kinds of treatment in a certain disease one had been successful in eight cases out of ten and the other in only two out of ten, yet in the case before him the second method is to be preferred. Such qualities, together with promptness in determining whether to quiet or lower, or to rouse and sustain; a wise boldness in setting aside the consideration of the particular pathological change for a time, and concentrating the whole attention on the patient—these are gifts and acquirements that no mere learning or science can impart. They belong to mother-wit or common sense, and they make the common ground on which the skilful practitioner, and the clever nurse, and the intelligent wife or mother, may meet and work together for the salvation of the patient. It is the want of such qualifications that often deprives the practitioner of the authority and influence that otherwise might be accorded to his learning.

It is, I once more repeat, more in the practice of the art that medicine is judged of, than in the science which is its rational basis.

And till something of the latter has been learned by the public, so that the difficulties of the art may be comprehended, till then its occasional shortcomings will sometimes shake the allegiance which is its due, and render some part of the public ready to transfer their trust to systems of arrogant pretensions and of seeming occasional success.

But in the progress of mankind we may be certain that rational medicine will maintain its supremacy. It is impossible that it should be otherwise. The road which it takes is the right one, and the science must win nearer and nearer to its goal. If Nature is to be made our servant, we must understand her operations. If we wish to employ her powers under new conditions, we must thoroughly know their nature and their extent. The time may seem short in proportion to what has to be learned; but the time is not to be measured by individual lives nor even by generations. The poet may complain that

> "Science moves but slowly, slowly, creeping on from point to point;"

but still it does move, and it not only moves, but it moves securely and without fear of retrogression. How securely, no one need doubt or be ignorant who heard or read those masterly expositions at once of its progress and its principles which were delivered before this Association last year; and like proofs will, I doubt not, abound in the addresses which have been promised for the meetings which are before us.

These remarks, as you will have noticed, have reference mainly to what there is of speculative scepticism afloat as to the true character of medicine. I need not remind you, on the other hand, of the abundant practical evidences which are presented to us of the public trust in our art. I need not allude to the proofs which meet the busy practitioner in every step of his daily rounds, and in the invasion of his night rest, and which throng in his consultation-room. He might say much of the touching, often painfully touching trust reposed in his skill. Nor is it worth while to dwell on the feelings of the public, as evinced in their anxiety to provide at great cost for their poorer brethren the advantage of medical help in Hospitals and Dispensaries; or on the confidence of the Government of the country, as expressed in their appointment of medical officers to the great public services. No naval or military expedition would move without its proper medical staff. And private enterprises are incomplete without a like equipment, from that of the passenger ship that crosses the ocean in a few days, to that

of the travelling amateur who will not trust himself in deserts or even in remote cities without a medical companion. But there is one proof of a most solid and substantial kind as to the confidence placed in medical science, to which I must advert for a moment. It is often said as to political characters, that the statesman who carries the country with him is he on whose wisdom the moneyed class depend, the great authorities in Lombard Street and the Exchange. Now almost every day indications of the faith reposed by this class in medical science, are brought before us in the examinations which we have to make and in the reports to fill up for the security of the enormous wealth which is held by the Insurance Companies. Were medical science a mere collection of doubtful guesses, vague conjectures, traditional prejudices, and ever varying hypotheses, would all this wealth be staked on the opinions of medical referees, opinions founded on facts that have been elicited and even extorted from subjects who are often anxious to conceal them? But I need not pursue this subject.

Besides other titles to public estimation won by the profession, there is that which is due to the increasing amount of mental culture among our brethren, and which must inevitably lead to their gradual elevation in the social scale. At all periods in the history of our art there have been men eminent at the same time for their professional skill and for their general learning. Dr. Freind thus speaks of some of the Greek physicians:—

"If we compare any of the Greek writers in our faculty, from the very first of them—Hippocrates—to the time we are now speaking of, with the very best of their contemporaries of any art or profession whatever, they will be found not at all inferior to them, either in the disposition of their matter, the clearness of their reasoning, or the propriety of their language. Some of them have even written above the standard of the age they lived in, an incontestable instance of which is Aretæus. * * * Galen himself was not only the best physician, but the best scholar and writer of his time: so great an honour have these authors done to their profession, by being versed in other arts and sciences as well as their own." (*History of Medicine*, vol. i., p. 220.)

It was not less so in later times. Jerome Cardan was so celebrated for his practical skill, that an archbishop of St. Andrew's sent for him from Padua; and, on his way, the Italian physician prescribed for our poor young king, Edward the Sixth. But he was not less renowned for his learning. He invented a system of arithmetic, and a system of algebra. He wrote treatises on the sphere, on circles, on Ptolemy's

geography, and on Euclid's Elements; also on astrology, on chiromancy, on physiognomy, on fate, and on games of chance. Among his miscellaneous works we find mention of epigrams and poems, and of discourses on wisdom, on consolation, and on the immortality of souls. His professional writings were considerable, the chief being a *Commentary on Hippocrates;* also a work entitled *Contradicentia Medicorum*, and another, *De Malo Medendi Usu.* In the 17th century flourished Sir Thomas Browne, author of immortal works, which not only proved him to be master of all the science of his own and of past ages, but which now, after having been for a time partially forgotten, are placed on the same shelf with the best productions of English literature. And in the next century, Dr. Meade was not only the most eminent physician in London, but his name was dear to every one in Europe who cared for science, and learning, and the fine arts. But why should we go for instances beyond our own locality, when we can remember Dr. Prichard, who possessed an amount of knowledge and power that might have been divided amongst several persons, every one of whom would have been endowed sufficiently to attain to high renown in the several departments of science with which Prichard's name is indissolubly united? Ethnology, the science of language, psychology, and practical medicine, may all point to him as one of the illustrious dead.

If the present time does not present any instances of various learning, quite comparable to the names which have just been noticed (though we do not forget the elegant and erudite contributions to science and literature which we owe to the accomplished pen of Sir Henry Holland); still, if I do not mistake, there are in this day a far greater number, than at any previous period, of members of the profession fairly imbued with the science and learning of their time. And I think I may venture to add, that there is not now so much reason, as formerly, for fearing the disapproval of the public on this account. It is but too true, that once the general accomplishments of the medical practitioner were regarded with suspicion, as if that man could not be trusted in the exercise of his art who showed a capability of acquiring some knowledge of other subjects, and who made his recreations, and embellished his life, by the study of polite letters and fine arts. In those times he might mount his hunter, or sling his fowling-piece over his shoulder, or walk to the bedside in the attire of a sportsman; and

he might spend his evenings in the theatre and the assembly-room, and his nights over whist and billiards; but were he known to be illustrating some obscure point in history, or even elucidating some matters of natural science removed from the duties of his professional routine, his reputation was in peril; but if he was suspected of an ode or a sonnet, the jeopardy was extreme! The members of the legal profession were liable to the same suspicion of unfitness for their calling, if they occasionally refreshed their minds with science and literature. But happily we live in wiser and better times; and now I believe that those among the public whose approbation is worth having, are as ready to confide in a practitioner who shows mental capacity and mentral training in matters of which they are competent to judge, as in one who has merely a character for cleverness in things about which they are unable to form a correct opinion.

At a first view it might seem that I have spent too much time in discoursing, before the members of a learned profession, on such a subject as the kind or degree of estimation in which that profession is held by the public. Our art being founded on the sure basis of a true science, it might seem more worthy of its dignity to be indifferent to the opinions of the uninitiated. Bent on the pursuit of truth, we should be deaf alike to applause and to disapproval. This might be, if the investigations were carried on only in the abstractions of the library, or in fields remote from the haunts of men. But the truths we seek are for the most part gathered where human beings are thickest, and with many of whom we are on terms of closest intimacy. The votary of medicine studies amidst the sanctities of hearths that are not his own; by bedsides, where husbands and wives, and parents and children, in the anguish of their pain or grief, are weighing every word he drops—are scrutinising the play of every feature in his countenance. His philosophy does not range the stars, or dive into the recesses of the earth's caverns; it walks in the trivial paths of daily life; its matter is the commonest experience of suffering men and women; its speculation is mingled with, nay, grows out of and ends in the daily duties of the calling by which he earns his bread—*Laborare est cogitare.*

If, then, we gather our science and reflect upon it, and turn it to its proper uses, in the midst of our intimate relations with our fellow-creatures, we cannot, by the constitution of our minds, or by the

necessity of things, avoid taking account of the opinion which is held of the science we thus learn, and the art we thus practice. If it is of importance to us, it is equally so to those we have to deal with. Precepts will not be obeyed, unless their authors are respected. And that that respect should be entertained, I may say, without fear of contradiction, that every medical philosopher, every medical practitioner who deserves the name, would gladly see the mass of mankind studying in order to obtain some idea of the principles on which medicine proceeds, and of the methods by which she endeavours to accomplish her purposes. She throws open her studios and workshops, and invites the world to enter. To her mysteries no password is necessary. All who have the requisite knowledge may be free of her guild, and that knowledge may be acquired by all who choose to undergo the necessary labour.

We do not deny, that, over and above the love of science for its own sake; over and above the desire of seeing mankind profit by the discoveries and applications of medicine; over and above the anxiety to obtain independence, or even to succeed in the primitive objects of labouring life; over and above the simple wish to do our duty; over and above all these motives there is the aspiration for fame and glory, "that last infirmity of noble minds." A thirst for honour, fame, glory—or, if you prefer to call it, a simple love of approbation, is one of the strongest of the springs which give motion to the machinery of human life. It is an instinct implanted in man by his Maker. Like all his instincts, it is to be controlled by reason and to be directed to its legitimate ends; but still it belongs to the nature of man, and it is not to be ignored, much less to be blamed or derided. All men who do great deeds are moved by it, though some avow the impulse more unreservedly than others; and I do not doubt that the sentiment smouldered with a strong heat even in the bosom of Wellington, though it did not flame out visibly as in Nelson and Napier. To suppress it is to do violence to our nature; to pretend to be above it is the hypocrisy alike of the arrogant self-sufficient stoic, and of the dull passionless ascetic. To say that it should be subordinate to and concurrent with duty, were a needless platitude. Happily, in our profession the two principles may work co-ordinately and harmoniously. And in the splendid roll of worthies which the annals of our art can display, we may observe with pride how inseparable was their glory from their

duty, the one sustaining and animating the other. To them might be applied, as truly as to any of the heroes of war or civil fight, those thrilling words of the Laureate—

> "Not once or twice in our fair island story
> The path of duty was the way to glory;
> He that ever following her commands,
> On with toil of heart and knees and hands,
> Through the long gorge to the far light has won
> His path upward and prevailed,
> Shall find the toppling crags of duty scaled,
> Are close upon the shining table lands,
> To which our God himself is moon and sun."

In the foregoing remarks, I have only thought it worth while to consider the public appreciation of medicine as a science and art. I have said nothing of the position which the profession takes in its moral aspects, and especially in regard to benevolence and charitable action. And nothing needs to be said. It may apply for its character to the public and to a higher tribunal. It may be said, and in all humility and reverence, that if at some time an account should have to be rendered of the callings to which men have devoted their talents and their exertions, though it may not be demanded what territories have been conquered, what foes subdued; nor by what intellectual mastery the forces of nature have been made subservient to the will of man, or what discoveries have been achieved in science, or what inventions in art; nor what beautiful forms have been fashioned, what glorious thoughts conceived, or in what harmonious words set forth; nor what polities have been founded, what laws laid down, with what energy enforced, or with what wisdom and eloquence expounded; nor what indisputable dogmas have been defined, or what casuistical difficulties resolved; but should it be asked, with terrible simplicity, what has your calling done for the afflicted sons of men, for the hungry, the naked, the sick, and the imprisoned?—then I do not think much fear need be entertained for the comparative sentence to be awarded to that calling which you and I have the privilege to follow.

I almost feel that some apology is necessary for having discoursed on such subjects before such an audience as that which I have the honour of addressing. But it seemed to me that, as the well-being of the profession, though depending mainly on its own internal constitution, organisation, and conduct, must derive a reflex influence from

its relations with the outer world, the consideration of these relations might not be altogether inappropriate to the commencement of the Annual Meeting of an Association, the objects of which are not only the mutual improvement and instruction of its members, and the promotion of mutual goodwill, but also the advancement of the character and the elevation of the aims of the profession. Of these, we must all agree in esteeming the highest to be utility to our fellow-creatures. And it cannot be doubted that this utility is in no small degree dependent on the estimation in which the profession is held, and on the confidence with which its help is appealed to.

THE HEALTH OF CLIFTON.

Read at the Meeting of the British Association, in 1864, at Bath.

THERE are many persons who are quite ready to admit the truth of certain numerical results, though unable or unwilling to trace the antecedent arithmetical processes; but who, nevertheless, not unfrequently find that, while in sight of most vivid and definite figures, the facts belonging to them are still somewhat hazy or shadowy, and that X Y Z, even in the face of correlative and unquestionable equations, may still look like unknown or somewhat equivocal characters. On the 6th of August last a severe shock was inflicted on the sanitary sensibilities of Clifton. On that day the readers of the *Times* beheld the name of Clifton hung up, as it were, on one of the columns of that journal for exposure as one of the most mortal of watering places. The proclamation was an extract from the Registrar-General's Quarterly Report. The feeling in the locality was very like what would thrill the inmates of a nunnery were they to be told that high authority outside the walls had declared the virtue of their institution to be at no higher a level than that of a penitentiary. There was the Registrar-General's Report—the figures as plain as the "Mene, mene," on the walls of Babylon, and almost as much in need of interpretation —24 in 1,000 is the annual rate of mortality in Clifton. The Isle of Wight has only to answer for 15 in 1,000; Newton Abbot, including Torquay, for 16; Cheltenham for 17. "Why," asks the Registrar-General, with Rhadamanthine severity, "why is the mortality of Clifton 24 in 1,000?" And this terrible question is asked about Clifton as one of the watering places. The question would be startling

enough to one who has taken only a superficial view of Clifton with its crescents and terraces, and broad avenues running along or just below an elevated ridge of mountain limestone, and abutting on breezy downs, and resting on a soil which in its nature and inclination is singularly unfavourable to the retention of moisture. The question is still more startling to one who observes how large a proportion of the houses must belong to persons in possession of the comforts and luxuries of life, and of the means of preserving health ;* not less startling to one who knows that a thorough system of public sewerage has been completed, and at no small cost to the community ; and most startling of all to those who have been for many years familiar with the diseases of the locality, and who know that in what is understood by Clifton the watering place there are no diseases that can be called endemic; that typhoid and typhus fevers are of rarest occurrence, and that when occurring they are of extrinsic origin ; that cholera, dysentery, and erysipelas are unknown in their zymotic forms, and that, in short, zymotic diseases, with the exception of measles, scarlatina, and hooping cough, are seldom met with. But the surprise of the numerical statement alluded to subsides when it is explained that Clifton in the Registrar-General's report does not mean merely the place which we have just glanced at, but Clifton the watering place, together with a very destitute district in the parish to be noticed presently, and also with a Poor-law district, including five other sub-districts, scattered at considerable intervals over an area of 27,199 acres, and in some parts densely crowded with the poorest of houses and inmates (a large portion not to be surpassed in their destitution by the tenants of the closest and dirtiest quarters of an over-peopled commercial city or sea port); these sub-districts making up a population that is almost quintuple the population of Clifton proper. It is true that there is a table in the Registrar's report (which was not published in the *Times*) which states the annual rates of mortality of several watering places, and of Clifton among them, and in which there is inserted the parenthesis in reference to Clifton, "including a part of Bristol City and Bristol Workhouse." But this is a most inadequate qualification. Clifton of the Registrar-

* From a table which Mr. Henry Collins, assistant overseer, has been so good as to send me, I find that out of 3,304 houses rated on the last poor-rate, those rated above £15 are 2,342, and of these the number rated above £20 is 1,935. There are 738 rated at £10, and of these there are 194 at £5.

General is Clifton, the name of Clifton Poor-law Union. It is Clifton the watering place, *plus* its own parochial appendages, *plus* the sub-district of St. Philip and Jacob, with 33,000 inhabitants, nearly three miles distant; *plus* Ashley, St. Paul, and St. James, with 12,000 inhabitants; *plus* Stapleton, with nearly 10,000 inhabitants, about which sub-district something very special will have to be said; *plus* Westbury district, with nearly 11,000; *plus* St. George, numbering more than 10,000 inhabitants. This enumeration reminds one of the prayer of the excellent minister at Rothsay, who called down the blessings of Heaven on his own island, and liberally begged that they might be extended to the adjacent islands of Great Britain and Ireland. But, to return to figures, the population of Clifton, including all that belongs both to the watering place and the parish, is between 22,000 and 23,000, while the whole Poor-law district named Clifton Union, a seriously overpowering *nominis umbra*, contains nearly 100,000.

Now, the annual rate of mortality for this union, 24 in 1,000, was calculated from a quarterly return of 587 deaths, which, multiplied by 4, gave 2,348 for the year; and this number bears to the population estimated as 99,708, a proportion of 24 in 1,000. But, on inquiring of the Registrar of Clifton parish, I found that the deaths were 121 in the June quarter. This number, multiplied by 4, and computed in proportion to the population, 22,754, gave an annual rate of 21 in 1,000. There is, of course, a great difference of import as to mortality between 21 in 1,000 and 24 in 1,000. But, on looking further, I found that vast differences in the ratios of annual mortality will appear if you take the quarterly figure for a type. For example, the quarterly return for Clifton parish in June last year was 101, which, treated in like manner, yields an annual rate of only 18 in 1,000. But take the return, 79, for the March quarter in the year before (1862), and with the same mode of calculation you have an annual death-rate of only 14·8, a lower figure than that of the Isle of Wight death-rate in the Registrar-General's table of watering-places. The actual number of deaths in Clifton parish in the whole year of 1863 was exceptionally high, for it was 465. This is at the rate of 21 in 1,000. But in 1862 it was only 365, which, reckoning the population at 22,000, would make a death-rate of only 16 in 1,000. In the year before, the deaths were only 329, and those bore a proportion to the population of only 15 in 1,000. But the question might, perhaps, be asked—does not the

increased mortality of last year, of 21 in 1,000, argue the increase of some local morbific cause? Were this the case it would be a curious result of increased attention among all classes to sanitary improvements, and just when extensive drainage works have been completed. It certainly does not seem fair to affix a sort of sanitary reputation to a place for good or for ill, founded on the return of deaths for one year, much less for one quarter. Thus, the annual death-rate for Cheltenham, calculated from the quarter ending June, 1864, is only 17 in 1,000. But, if a like list of watering-places had been made out last year, on like principles—that is, with annual death-rates calculated from the quarterly return for June—Cheltenham would have appeared with 21 in 1,000 against it—exactly the mortality assigned to Clifton parish by a calculation for the corresponding quarterly return in the present year, or for the exceptionally large number of deaths in 1863; while the death-rate of Clifton parish, founded on the quarterly return of June, 1863 (viz., 101), would have been only 18 in 1,000; and as I have already said if founded on the actual annual return of 1861 it would have been only 15 in the 1,000.

Before examining some other facts in reference to the figures belonging to the Clifton *Union* it is right that I should say something more respecting the death-rate of Clifton *Parish*. Whether it has been in one year as low as 15 in 1,000, and in another year as high as 21, the mortality derives its largest contributions from a locality out of sight or unknown to most visitors to Clifton. It is an appendage rather to Bristol than to Clifton, being inhabited by poor artisans and labourers, many of them in connection with the sea-port. It is in the immediate neighbourhood of the Hotwell Road which runs along the edge of the floating harbour, formerly the bed of the river Avon, for which a new channel was cut early in the present century. The houses are built in groups characteristic of the worst arrangement of houses in crowded cities, where space is economised at the cost of ventilation and cleanliness. The houses in Hotwell Road and certain other situations belong to what may be called the low level of Clifton parish, and, though the number of the houses is very small in proportion to those distributed over Upper Clifton, the whole deaths in the said district are nearly a third more, and the deaths from zymotic diseases nearly quadruple those in the upper parts. And it cannot be doubted that were the Board of Health to insist on the correction of sanitary evils in this district the death-rate of Clifton parish would bear a com-

parison with that of the most healthy district in Great Britain. Even now the annual average death-rate calculated from the deaths in the five years from 1859 to 1861 is only 17 in 1,000.

I have shewn how Clifton proper is confounded in the registration tables with Clifton Union. This is no fault of the Registrar-General. The misrepresentation and the injury must be laid at the door of the Poor-law Board. But they thus afford an illustration of the importance of appending full verbal explanations to figures. A painfully striking example of this was presented during the epidemic of cholera in 1849. It was the custom at that time to publish in the newspapers daily reports of the number of deaths from cholera in every district where the pestilence was prevailing. In these lists Clifton made a ghastly figure, but it was not Clifton the watering-place, which, in fact, had only one death from cholera during the whole epidemic. The numerical statement belonged to Clifton Union, but, the distinction having been only occasionally made in the journals, the public in general were under the impression that the deaths occurred in the watering-place, which was, therefore, very naturally shunned, as if woefully plague-stricken.

I cannot forbear adducing another instance of the importance of adding explanatory statements to figures. It is connected with the meteorological tables of Clifton. The figures representing Clifton are supplied by Mr. Burder, an ardent and industrious cultivator of meteorological science. His instruments are set up at the very extreme edge of an outlying new district of Clifton. This situation is much more exposed to cold winds than are those older parts of Clifton, which have for so long a time been the resort of persons seeking a comparatively mild climate for the winter. No such invalids would be directed by medical advisers, acquainted with the locality, to choose the situation just noticed, though it is in many respects a pleasant and healthy site. Another set of meteorological figures have been taken for many years in a part which is better known as Clifton (in a garden just below the crest of the hill), and under the direction of Mr. W. Giles, who has paid great attention to this branch of natural science. In both situations the observations are made with the best instruments, and registered with great care and fidelity. As might have been expected from the difference of sites, the minimum readings are nearly always lower in the more exposed of these situations. The difference of the minimum is sometimes as much as three degrees, and seldom

less than two. Thus, for example, in the year 1862 the lowest degree in Clifton proper was 22; but in the Registrar-General's report for Clifton it was 19·4. In the year 1863 the lowest reading in the former situation was 29. In the Registrar-General's table it was 26·7. Now, a difference of three degrees in a minimum will tell very much on the character of a place as to mildness, and in the following manner:—The public eye does not catch figures representing mean temperatures, though these are more important to scientific observers. If it did, the public mind would not, perhaps, think so much of extreme thermometrical readings when estimating the qualities of a climate. But when a summary is published in the newspapers, telling how the thermometer on some particular day fell as low as so-and-so in such-and-such places—a locality that has previously enjoyed, and with reason, a good reputation for mildness, may, by dropping into such a catalogue, suffer a considerable reduction of public estimation. Into such a list Clifton has once or twice fallen by help of the Registrar-General's figures, taken from a spot which does not fairly represent Clifton. This, then, is another instance in which figures may inflict a wrong for want of verbal explanation.

I return to the registration of deaths in the sub-districts of Clifton Union. One of them is called Stapleton sub-district, taking its name from a village about three miles from Clifton proper. In this sub-district are included Filton and Stoke Gifford, and Winterbourne, villages two or three miles apart, and the most remote being nearly ten miles from Clifton. The tourist driving through them is charmed with the beautiful scenery—the upland lawns, the undulating meadows, noble trees, comfortable cottages, flourishing farms, and other signs of a purely rural district. Here, at least, in this all but Arcadian region, we shall find mortality reduced to the minimum compatible with human destiny. But, alas! on consulting the register we find an appalling death-rate. Calculated as before, from the Registrar-General's type, the quarterly return of June, 1864, the annual ratio is no less than 45 in 1,000 for this Stapleton sub-district. Malarious swamps, stagnant pools, rotting pig-styes, and farm-yard abominations start up in succession before the mind to account for such ravages in Arcady. There are, however, no such causes in existence, and it is quite needless to draw upon the imagination. The anomaly is solved by the simple information that in Stapleton parish stands the poorhouse of the whole Clifton district Union, also the poorhouse of the whole city of Bristol,

also the Public Lunatic Asylum of Bristol, which three institutions, having their dead registered in Stapleton sub-district, might swell the mortuary returns of the most healthful locality to a frightful figure. Deducting the contributions from those establishments, the deaths in 1861, instead of 334, would have been only 113; in 1862, instead of 318, they would have been 142; and in 1863, instead of 337, they would have been only 146. The death-rate for 1861 would have been about 13 in 1,000; in 1862, from 14 to 15; and in 1863, 15.

In returning to the question of the Registrar-General, put so prominently, "Why is the mortality of Clifton (meaning Clifton Union) 24 in 1,000?" let us consider the sub-district of St. Philip and St. Jacob. It used to be entitled the out-parish of those saints, being the extension beyond the city boundaries of the parish so named. It is a wide, dreary region, tenanted by the poorest of artisans and labourers, and the nameless multitude whose means of existence are mysteries. Into it overflows, and collects and ferments, much of the scum of Bristol poverty. St. Philip and St. Jacob might patronise poverty, and dirt, and destitution, with as good a title as St. Francis of Assissi. If an earnest preacher in a Bristol pulpit wishes to call up images of misery, he evokes them from the parish of St. Philip and St. Jacob. Some of the most hard-working clergy and ministers of all denominations, and lay preachers, and charitable visitors spend their powers, and their means, with unwearying self-denial, many for a lifetime, and feel that there is still a vast mass of wretchedness which they cannot remove, and can scarcely lighten. This sub-district, being too large to be included in Bristol city, is added to the Clifton Union, though distant more than two miles from Clifton the watering-place. It numbers between 32,000 and 33,000 inhabitants, and, after what I have said of the poverty of the district, it is not to be wondered at that the mortality may be reckoned at 26 in 1,000 for the June quarter of the present year. But, strange to say, there was a quarterly return in 1862 which would have made the annual rate only 15 in 1,000, while in one of the quarters of last year the calculation would have given 32. But the actual deaths for the year 1863 would make 28 in 1,000.

There is another sub-district called Westbury. It includes Henbury and Compton, two rural localities, unburthened with union or city poorhouses. The annual death-rate, computed upon the quarterly return, June, 1864, amounts to only 16 in 1,000. But, if the quarterly return for September, 1862, had been selected, the death-rate would

have been only 9 in 1,000. The quarter June, 1863, would, however, have given 18 in 1,000. The rate, calculated from the annual deaths in 1861, 1862, and 1863, is between 15 and 16 in 1,000.

The sub-district called Ashley partakes of both rural and urban qualities, and contains a population of mixed character in regard to the possession of the comforts of life. The mortality computed from the quarterly return for June, 1864, would be 21 in 1,000. The actual deaths in 1863 make the mortality 22 in 1,000; in 1862, 19 in 1,000; and in 1861 only 18. A portion of this sub-district contains a town population (the parish of St. Paul and St. James) of much the same quality as that of St. Philip and St. Jacob, and the mortality of this part counteracts the lower ratio that would be yielded by the more rural districts of Horfield and Ashley.

The sub-district of St. George is peopled mainly by persons of the poorer class, but their dwellings are more scattered than in most suburbs. The people are chiefly colliers and labourers, many of the latter being agricultural. The sanitary advantages of avoiding the congregation of dwellings in small areas is illustrated by the comparatively moderate death-rate. The mortality for the June quarter, 1864, would give an annual rate of 20·60 in 1,000. The actual deaths in 1863 make the ratio 23 in 1,000, in 1862 only 18, and in 1861 19. Contrast with these the ratios for the same years in St. Philip and St. Jacob. They are respectively 28, 20, and 24 in 1,000.

Having thus briefly considered the sub-districts, let us return to Clifton Union. When clearing Clifton Proper from the stigma attached to Clifton Union I admitted the number 24 in 1,000 as the death-rate belonging to the latter, calculated from the quarterly return for June, 1864. But even here it may be shewn that it is possible to paint the Prince of Darkness blacker than his real complexion. If you take the actual deaths in the years 1861, 1862, and 1863 it will be found that the ratios are respectively 21, 20, and 25 in 1,000. The mean of these is 22. So the jet black of 24 is brought up to the *bistre* of 22. But if you take in the years of 1859 and 1860 there is a still further mitigation, for then the average of the five years gives 20 4-5ths. Again, the parish of St. Philip and St. Jacob has, as we have seen, for the years 1860, 1861, and 1862, 24 in 1,000; but if we take also the years 1859-60 the average annual mortality drops down to 21 4-5ths.

I think a sufficient answer has now been given to the Registrar-General's query, "Why is the mortality of Clifton 24 in 1,000?"

calculated as this ratio is from a quarter of exceptional mortality, and brought up to this high figure by quotas of extrinsic origin, for which Clifton Proper, or Clifton the watering-place, with its average mortality of only 17 in 1,000, is not otherwise answerable than as having been unfortunately compelled to share its name with a wide, populous, and in some sub-divisions, a very destitute Poor-law district. It will have been noticed that in the foregoing remarks great stress has been laid on town pauperism. In rural districts there is, of course, pauperism also. But the sanitary evils incident to poverty tell with much greater force on life in towns than in the country; for in the former the evils of defective house drainage, of the crowding of residents in small tenements, of ill-ventilation, and of scanty or unwholesome food and drink, are all concentrated and enhanced by the aggregation of such houses in small spaces. The occupants of the meanest cottages in the smallest village are more or less, during the day, inhaling the freshest air of Heaven in the open fields. But the town artizan or labourer passes from his miasmatous home into a workshop or beerhouse where the air is scarcely, if at all, less impure. The sub-district of St. Philip and Jacob, for example, will doubtless have its mortality lessened by the completion of the public drainage works which are in progress; but still the condition of the inhabitants, as to their dwellings, their clothing, their food, their fuel, and their habits, must, if unaltered, keep up a high figure in the death-rate.

It has been seen to be unsafe, not to say unfair, to compute from a quarterly return the mortality of any particular locality, and contrast it with that of another locality, reckoned in the same manner. Zymotic diseases are apt to visit localities in succession rather than contemporaneously. Thus twenty or thirty deaths from scarlatina added to the ordinary mortality of a quarter in district A may give a figure which multiplied by four yields a ghastly annual death-rate, and district B shines brightly in contrast. But in two or three quarters the contrast becomes reversed, when B has been visited by a like pest. Thus Exeter, in the years 1861, 1862, and 1863, had a mortality which gave a yearly average of 23 in 1,000, but, were the mortality reckoned from the two quarters of the present year, it would rise to nearly 28 in 1,000.

It is interesting to compare the death-rates of different districts according as the population is purely urban, or all but purely rural, or mixed. Thus—

Towns.		Rural.		Mixed.	
Bristol	27	Thornbury	17	Clifton Union	21
Exeter	24	Kingsbridge	18	Tiverton	21
Worcester	23	Pershore	17	Bromsgrove	20

The mixed populations have thus an intermediate mortality. And if we add up the death-rates of unlike districts we obtain corresponding averages. Thus—

Bristol	27	Exeter	24	Worcester	23
Thornbury	17	Kingsbridge	18	Pershore	17
Gloucester	22	Plymouth	24	Stourbridge	23
Stow-on-the-Wold	18	Crediton	18	Evesham	18
	4) 84		4) 84		4) 81
	21		21		20¼

Or take 5 of the sub-districts of Clifton Union, excluding Stapleton, because of Bristol City Poorhouse—

Clifton Proper	17
Ashley	18
St. George	20
St. Philip and Jacob	21
Westbury	15
	5) 91
	18 1-5th

In Clifton proper—Town—but buildings good—sites open—some poverty; Ashley—semi-rural—more poverty; St. George—semi-rural—more poverty; St. Philip and St. Jacob—much more town—much more poverty; Westbury—rural chiefly—some poverty. Crowding and poverty together cause the highest death-rates. Ashley and St. George are not very unequal in rural qualities, but the poverty is greater in St. George's, and the death-rate is 20 against 18 in Ashley. The influence of these two causes is illustrated by the death-rates in the sub-districts of the old city of Bristol—

1.	St. Mary Redcliff	24
2.	Castle Precincts	29
3.	St. Paul	23
4.	St. James	36
5.	St. Augustine	20
		5) 132
		26 25-ths

N.B.—The mortality in 2 and 4 is increased by the deaths in a workhouse and in the Royal Infirmary.

This very humble contribution to statistical science, which has chiefly aimed at illustrating the importance of appending full verbal explanations to numerical statements, has turned almost entirely on death-rates. With the resources at present at command they afford us as much explicit information as can be obtained regarding the sanitary character of the locality. But I agree with the opinion expressed by my friend Mr. Rumsey in an able paper read before the Social Science Association at Bradford, that they are, after all, but imperfect exponents of the health and well-being of a community. We need some nearer term to Birth than its last antithesis Death. Between those extreme points lies a vast amount of human happiness and human misery which it would be desirable, whether possible or not, to gauge by such exact measures as we look for in statistics. Passing from Birth to Death the eye surveys on the one hand enjoyment, especially that enjoyment which depends on consciously vigorous action with an object, on the prosecution of worthy toils, and on the pursuit of honourable ambitions, and on the other hand it discerns suffering, infirmity, needs and desires struggling with incapacity, plans and purposes falling away from nerveless limbs, weakened wills, and worn-out powers, and a grisly train of maladies more terrible than pestilences because they are neither curable nor necessarily mortal. Of those opposite fates of a community, making birth and death respectively a blessing or a curse, a calamity or a consolation, we must know something more than what we know as yet if we would judge of the condition of a people. But such information the Registrar-General cannot impart, unless the public should so desire to receive it that they will be willing to have the public finances charged with large sums in the employment of an extensive sanitary organisation for reporting carefully from every locality, how air, and water, and soil, and food, and clothing, and occupations, and habits, and amusements, have told favourably or hurtfully on health and happiness. All honour to the President of this section for the immense energy and untiring patience with which he has exerted his remarkable powers in proving and illustrating the vital importance of vital statistics! Seeing how much he has accomplished with so imperfect a machinery, it is impossible not to wish that his genius might enjoy ampler scope, and have better materials to work on. Certainly, one would wish that the classification of numerical returns representing all the elements of the social life of our people should not be compelled to follow Poor-law

lines and limitations, which, however suitable to Poor-law purposes, may cause figures to express something very different from what would be their meaning, were the facts which they number grouped in accordance with scientific requirements rather than with the convenience of a special branch of national registration. Then the numerical death-rate of an ancient crowded city would express the mortality in that city, including items that are now transferred to a rural district, or appended to a healthy watering place. The numerical death-rate of a village would mean the mortality of that village, unswollen by the deaths in a city poorhouse. And the numerical death-rate of a watering place would express the mortality in that watering place simply, neither complicated with the mortality of distant rural retreats, nor burdened with that of the sickly suburbs of a crowded city.

ON MEDICAL EVIDENCE
IN
RELATION TO STATE MEDICINE.

BEFORE offering any remarks on the subject of the discussion in which we are about to be engaged, I beg to be allowed to say that, though I accepted the duty which the Committee of Management* did me the honour of confiding to me, yet it must not be inferred from their appointment, or from my acceptance of it, that the subject is one that has attracted or received my attention in any particular manner. I profess to treat of Medical Evidence in relation to State Medicine with about as much knowledge of it, and with as much reflection upon it, as may have been all but forced on the observation and thought of any one who has been working in the practice of our profession for a considerable number of years. Perhaps, therefore, my views, representing as it were the average experience and thought of the profession, may be more appropriate to the commencement of this debate than if I were in the possession of any peculiar amount of knowledge, or the propounder of any peculiar schemes of improvement. Not but that, as you will find, I entertain some rather decided opinions as to reforms that are required.

I think we must be all agreed that medical evidence in courts of law is not what we could wish it to be, whether with reference to what is just and what is creditable to the profession, or to what is required by the interests of the public. And, first, let us consider it with respect to ourselves—our character, rights, and interests.

* This Paper was read at the Annual Meeting of the British Medical Association in 1865.—Ed.

Medical evidence in general—that is, with the exception of the evidence specially given by *experts*—is *mixed* evidence. It is partly common, and partly professional or scientific; for it testifies both to what might have been seen and heard by any person who happened to be present at certain transactions, and also to what could have been correctly observed only by instructed senses. Likewise, it embraces inferences from the facts observed—inferences that have the authority of the presumed scientific judgment belonging to a well-informed practitioner of medicine.

The quasi-scientific evidence of the medical witness is not delivered in the form of a written report, carefully considered and carefully expressed; but it is given *memoriter*, *vivâ voce*, and for the most part in answer to questions propounded by persons to whom the subject is new, and to be heard and understood and estimated by persons who have no knowledge whatever of the subject scientifically considered.

The evidence, though often involving nice and scientific distinctions both as to description and as to inference of cause and effect, has to be delivered by the medical witness in language as free as possible from the terminology through which much of his professional knowledge was learned, and which very terminology was invented to convey knowledge which could not be expressed with requisite precision in common language.

Again, the evidence is often of a kind that involves minute investigations, and an exact knowledge of subjects that may not be actually required by a medical man more than once or twice in a lifetime, however experienced and eminent he may be as a practitioner. He may have got up the subject thoroughly when going through his academic curriculum, and he may be an old man before he has had to draw upon such knowledge for juridical purposes. It may have been as latent, or unemployed, or well-nigh forgotten, as the processes and foramina of the spenoid bone or the reflections of the peritoneum; or as the natural history of some plant, in some remote corner of the globe, that furnished some dusty old drug once in favour with doctors; or as the composition of some obsolete but once fashionable pharmaceutical formula. Which of us would like to have to recount on a sudden the ingredients of pulvis contrayervæ compositus? And which of us would like to have to tell all the proofs that an infant had never lived an extrauterine life?

Let me endeavour to relieve the dulness of this part of my communication, by relating what on one occasion passed between a most eminent member of the legal profession and myself, not in a court of law, though at a public meeting. After a learned and highly interesting lecture on certain points of the English language, delivered at the Bristol Institution, by the Rev. J. Earle, formerly Professor of Anglo-Saxon at Oxford, a vote of thanks to the lecturer was proposed by a legal friend, a gentleman not more eminent by the high office which he holds, than distinguished by the ability and philanthropic zeal with which he has instigated various social reforms. In the course of some most valuable remarks on language, he said that those spoke best, and with most clearness and precision, who thought least of the effect which what they were saying would produce upon their hearers; and he declared that it was the want of such unconsciousness that made medical witnesses the worst of all witnesses in courts of law. And he clenched his remarks by alluding with playful malice (seeing that many of his medical friends were present) to a very sarcastic account of medical evidence in cases of lunacy with which a Lord Chancellor amused the House of Lords a few years ago. It happened to be my duty to second the vote of thanks; and I should have been a recreant had I not availed myself of the opportunity of endeavouring to wipe away the aspersions cast by my learned friend on the character of medical witnesses. I ventured to say that, whatever psychological or philological truth there might be in the remark that a speaker should be free from self-consciousness or thought in regard to the effect of his words, yet my learned friend had omitted to mention the chief causes of the disadvantageous figure made by medical witnesses, which was, that they had to speak of things about which their audience, including the simple-minded jurors, the quick-witted gentlemen of the bar, and even the august occupants of the bench, were profoundly ignorant; and, moreover, that such witnesses had to translate as they were speaking, to put aside the language in which their professional knowledge and ideas most naturally flowed, and to accommodate what they had to say not only to the uninstructed understanding of their hearers, but also to the vernacular language; that, in the course of this process, much might be lost both of force and accuracy; and that the process required some presence of mind, especially under cross-examination, which mental quality was not likely

to be aided by a severe injunction from the bench to give a plain answer to a plain question, or by an ironical petition from counsel that the witness should for the time being disencumber himself of his superfluous learning, and condescend to the language of ordinary mortals. And, as to the allusion to the Lord Chancellor's mocking description of medical evidence, I could only say that, till I read his lordship's speech, I did not think that even a Lord Chancellor could, upon a medical subject, display so singular a lack of information. After the meeting my friend told me that what I had said was not only fair in the way of retort upon an antagonist, but also that it was strictly and literally true.

I cannot leave the discussion of this part of my subject, the unsatisfactory position of medical witnesses as seen from our side, the side of the profession, without touching on the injustice with which they are treated as to remuneration for the professional evidence which they give, and for their loss of time. Were their evidence only such as might be imparted by ordinary spectators of a transaction, they would not be entitled to more consideration than the latter, who have only to tell truthfully what they have seen and heard. But when a man has to enlighten the court with knowledge derived from his art, and resulting from laborious and (it may be) refined researches for the elucidation of the point at issue; and when, owing to the difficulties incident to speaking in a witness-box, he may incur the risk of having his professional reputation seriously damaged by the reckless attacks of a counsel who does not hesitate to sacrifice any individual to the cause of a client, it is certainly hard that for all his trouble and danger he should receive no higher compensation than if he had testified to having seen one Thomas Hodge stealing stakes out of a fence. Yet such is the fact. A surgeon to a hospital who, almost every day, devotes a vast amount of time and skill to the gratuitous relief of the poor, may be summoned to a court twenty or thirty miles distant from the sphere of his practice, and be kept for two days from his patients, in order that he may help the jury to decide whether a man died in the said hospital from the effects of a blow on the head received in a brawl, or from the effects of his previous habits of drunkenness.

Many grievances of like kind might be adduced. I will give only one other example. A friend of mine in large practice, Mr. Greig of Clifton, was subpœnaed upon a trial in the Court of Queen's Bench.

A gentleman, who had formerly been under my friend's care, resisted the exorbitant claim of an empiric, to whose treatment he had foolishly submitted himself. Mr. Greig was for two days dancing attendance on the court, to the very serious inconvenience to himself and his patients; and, after all, no trial took place, and he received only a very paltry sum for his expenses. Yet his evidence, if called for, would have been purely scientific evidence as to the condition of the defendant's health.

I think I have read somewhere that medical men ought not to complain of these public requisitions, because forsooth they are generously exempted by the State from certain offices or services which might interfere with their professional duties; for example, they are not called upon to act as jurors, nor to collect taxes, nor are they drafted for the militia. But it is obvious that these exemptions are quite as important to the welfare of the public as to the convenience of our profession. Besides, they are not peculiar to medical men. There is a long list of classes of persons equally exempt, and among them are practising barristers and attorneys. Has any one sufficient power and liveliness of imagination to conceive that these latter gentlemen would bestow gratuitous services on the public in courts of law in consideration of their exemption from certain public demands for services, which exemption they share with medical men? Fancy how the Temple and Lincoln's Inn and Westminster Hall would ring with inextinguishable laughter at a proposal so unspeakably ridiculous!

Let us now consider our subject from another point of view—that occupied by the public; and it will scarcely appear more satisfactory. First, it cannot be satisfactory to the public to observe the chances run by justice in the accidents of a coroner's inquest. The important evidence to be delivered by the medical witness has to be elicited by the questions of the coroner and the jurymen. The explanation of the witness are often scanty and imperfect when freed from technical details; and confounding and bewildering when imparted with the fulness and minuteness which such an inquiry demands.

But, perhaps, under no circumstances does medical evidence appear to more disadvantage in the eye of the public, than when, in criminal trials, members of our profession give conflicting opinions. In trials for murder, was the perpetrator of the crime so far disabled by mental disease as to be irresponsible for his actions? Did the deceased person

die of natural disease, or of the effect of injuries? of disease or of poison? It has often been very difficult for the laity to judge on which of the conflicting opinions most reliance is to be placed. And the difficulty is often still greater in civil suits; as when one eminent medical witness declares that a person was competent to the making of a will, or to the management of his affairs, and another, equally eminent, no less emphatically denies it; or when one pronounces, in an action for nuisance, that a miasm or the product of a manufacturing process is deleterious to the health of a neighbourhood, and another assures the court that such agency is innocuous or even salutary; or when, in an action for *mala praxis*, one witness approves and another condemns the treatment of a patient whose fractured limb has left him lame for life.

In many of such cases a difference of opinion is almost inevitable. There are probabilities on either side; and the preponderance will be determined differently by different minds. In all departments of science, in theology, in law itself, such differences arise; and it is no special reproach to medical science that it has not attained to a precision, or an exemption from doubt and controversy, that can be predicated of very few departments of human knowledge.

But, notwithstanding the doubtfulness and ambiguity belonging to certain questions, it cannot but be regretted that such conflicts as I have hinted at occur so frequently; and I think it must appear to us that they are susceptible of abatement. Some diminution is to be expected from the advance of our knowledge, and its increased exactitude. Improvement in this direction will require time; but it is for the Association to consider whether some amendment might not be effected by changes in the mode of obtaining medical evidence in legal cases of all kinds. It seems to me that the dissatisfaction of the profession and the dissatisfaction of the public—the causes for both of which I have so slightly sketched—might be obviated by certain reforms in medico-legal processes; reforms that might be worthily inaugurated and promoted by the force of this great Association. On this subject I will venture to throw out one or two suggestions. First, then, I would say that, considering the enormous interests involved in medical evidence, considering the complexity and intricacy of the questions belonging to it and the processes for solving them; considering, also, the importance of having such questions treated by men of special

culture and training, of minds and avocations free from the embarrassment, fatigue, engrossment, and distraction, contingent upon ordinary medical practice—I cannot but think that it would be highly conducive to the public good, and that it would be most advantageous to our profession (for it would relieve individuals from anxiety, vexation, and peril to fame and fortune, now too often forced upon them, and remove from the profession generally the chances of unjust reproach, ridicule, and obloquy) were the State to appoint medical officers whose duty it should be to assist, or advise, or altogether supersede the ordinary practitioners in the conduct of medico-forensic inquiries. The medical practitioner has, in the discharge of his ordinary duties, enough of solicitude and painful responsibility without the addition of forensic functions; and it may be confidently affirmed that, after taking into consideration the amount of unpaid or miserably ill-paid service rendered by the profession to the public, they would be asking for bare justice in begging to have their extra duties removed or made more tolerable. But, as I have said, a reform in this matter concerns the interests of the public no less than those of the profession.*

Within easy reach of every practitioner there should be a state officer, to whom the former could refer in a difficulty, or to whom he might relegate the conduct of a medico-legal investigation. Setting aside all cases in which public inquiry is inevitable, I ask my experienced brethren whether cases have not more than once occurred under their observation in regard to which it would have been an unspeakable relief to them to have been able to confer with a person of authority, and thus to divide the responsibility, whether of initiating a delicate and painful inquiry, or of preserving reticence until further light should appear.

There is one kind of evidence which is being continually demanded of a medical man in respect to the administration of the law, which, although it is not given in a court of law, may at any time be the means of taking him into it, and even of causing him to appear as a defendant or culprit rather than as a witness. I refer to certificates of insanity. On this subject, I confess that I marvel at the long suffering —I should almost say the stolid supineness, the pachydermatous

* In the course of the debate which followed the reading of this little paper, Dr. Markham made some excellent observations on the absurdity of consulting experts after the conviction of criminals.

patience—of the profession. By these certificates we confer inestimable boons—first, on the family of the patient, by separating a member whose presence is distressing and often absolutely dangerous to that family; on the patient himself, by removing him to a place where he may have the best chance of cure, or be best cared for; and on the public, to whom the liberty of the patient might bring peril of life and prosperity. And for these services medical practitioners are liable to be held up to public scorn and obloquy as conspirators with mad doctors, as they are called by a vulgar and insulting metonymy, and even to be sued in courts of law for damages. How long the patience of the profession will allow itself to be thus abused I know not; but it seems to me that, whether or not any other changes be effected in the collection of medico-legal evidence, the profession should, if it have any self-respect, move for a change in the law as to these certificates. If they are still to be signed by ordinary practitioners, it might not unreasonably be stipulated that indemnity should go with the signatures. In signing such a certificate, according to the best of his knowledge and belief and conscience,—a certificate involving, though it does, the personal liberty of a fellow-subject,—the practitioner ought not to incur more risk than when he signs a prescription, on the issues of which attend not only the well-being and the life of the patient, but the maintenance of a family, its happiness, and that of circles of indefinite extent. The public have a sufficient security that such certificates will be carefully considered, in the disgrace that is the inevitable portion of those who have signed them in bad faith, or even without proper caution. Unless the law is altered, I think that the members of our profession would be justified in binding themselves by an engagement to one another, to refuse to sign all such certificates. The legislature could not compel us to sign them. Let it provide officers for that onerous and dangerous duty. But although by our passive resistance we could prevail, I trust that no such unseemly contention may be forced upon us.

Should the good time arrive when there will be such medical state officers distributed over the country performing functions such as we have seen occasionally performed to the great furtherance of justice by a Christison, a Taylor, a Herapath, whether father or son, a Geoghegan, a Maclagan, or a Penny, it would not be difficult to arrange that their duties should also extend to the surpervision of public health; for they

should not only be assistants in courts of law, but also counsellors at Boards of Health, where their presence is frightfully needed.*

It is a melancholy thought that in this great nation, so advanced in its civilisation, so zealous, and in many respects so enlightened in its philanthropy, justice and life should be left to the protection of such rude primitive processes as those of coroners' inquests, where there is not always the saving genius and science of a Lankester, and to the chance of competent witnesses; and that the lives and comfort and well-being of millions should be left to the ignorant minds and obstinate wills and parsimonious propensities of Boards of Health; and that, in all departments where medicine and law should be brought to work together for public and individual good by the conference of highest wisdom and largest and exactest knowlege, interests so momentous should be left to chances so perilous. A coroner *may* be capable of requiring and even directing a scientific investigation; the witness *may* have competent knowledge and sufficient presence of mind to give satisfactory oral evidence (though a carefully drawn up report by a commission would be far preferable); a certifier *may* have psychological discrimination and experience; and Boards of Health and Registrars of Births and Deaths *may* have some tincture of sanitary information; these are *chances;* but ought justice and life and liberty and public health and well-being to be left to such chances?

I venture to think that something more productive of security should at least be attempted; and, at all events, that the subject is worthy of the attention of the British Medical Association.

And so thinking I beg leave to propose that a committee be appointed, to take into consideration the present position of practitioners in regard to medico-legal investigations, and especially to confer upon the expediency of pressing upon the legislature the appointment of state physicians, whose duties might embrace both medico-legal investigations and the care of public health.

In submitting this resolution I am not at all unaware of the opposition which such a proposal is likely to incur from the public. It will be said at once that the plan suggested would involve a great

* Any one who wishes to satisfy himself of the manifold benefits likely to accrue to the public in regard to sanitary matters from the appointment of state physicians, should study the very able and instructive essays on State Medicine which we owe to Mr. Rumsey.

outlay of public money—an outlay not to be thought of when medical evidence can be extorted as at present from our too yielding profession. Nothing can be expected unless the public advantage can be shown to be seriously involved. There is nothing to be expected from a consideration of what is due to us as a profession; and if we move at all in the matter it should be with all the force of united action. The great professional corporations of the United Kingdom, the College of Physicians, the College of Surgeons, the Company of Apothecaries, the Council of Medical Education,—all should be invited to co-operate. When every method of conciliatory representation to the legislature has been exhausted without avail, it may then be for the profession to consider its resources in the way of passive resistance to demands as inequitable to its members, as they are inexpedient for the public good.

ADDRESS ON HEALTH.

Delivered at the Congress of the Social Science Association, in Bristol, October 4, 1869.

THE duty of this Department of the Social Science Association is, as its name implies, that of considering such questions as regard the promotion of Public Health—that is the health of large bodies of human beings. At first sight it might seem that if individuals and families take due care to preserve their health, the general health must be the natural result of it; or rather its sum total. And if all that is required for the purpose in view were an intelligent and assiduous observance of such rules of life as produce well-being, then the most promising line of operation for such associations as this, would be that of promoting the education of as many people as possible in matters belonging to individual health. They would have to be taught how to avoid disease and how to maintain the faculties of their frames in highest efficiency. This would be done partly by inducing them to study physiology, at least so much of it as bears directly on hygiene;* and partly by instructing them in those practical processes which science, or experience, or both of these may have established as salutary. But this would not be enough. No man can take care of himself irrespectively of the community in which he lives. And perhaps it is as well for the fortunes of mankind that individual and general welfare should be thus mutually dependent. It is true that the accumulation of many individual instances of disobedience to the laws of health must work banefully on the health of the community;

* Mr. Huxley's popular lectures on Physiology and Dr. Lankester's School Manual of Health are particularly recommended.

but all the efforts of individuals in conserving their own proper health would be incapable of neutralizing some of the causes of disease diffused around them, unless aided by the co-operation of the public. In vain would a man be temperate and judicious in his diet, regular in his exercise, punctilious in his ablutions, and ingenious as to his house arrangements, whether for temperature, or ventilation, or cleanliness, if the public sources of many of his requirements are deficient or corrupt; if, for example, the water supplied him is impure; if the air which he is so careful to let in abundantly is loaded with miasms; and if the well-ordered outlets of his dwelling are in relation with inadequate or obstructed public conduits and reservoirs.

Man, impelled by his instinct, constrained by his needs, incited by his emulation and his ambition, and attracted by his natural ties and affections, is necessarily gregarious; and he must pursue his good, and defend himself from evil by inducing or compelling his associates, through law, or instruction, or example, to be as wise and prudent as himself. Men must help one another to make the best of their conditions of existence, and to keep themselves in harmony, if possible, with that part of God's universe that environs and maintains them; or if not in harmony, then in successful conflict with those hostile agencies, which it has pleased the supreme wisdom that man should exert his faculties in quelling, or abating, or abolishing utterly. But alas! how slow have men been to see their good and to ensue it. Over what long and doleful ages have they left themselves and their brethren to pine in long maladies, to shiver and burn with fevers, to be stunted in growth, and to become the victims of loathsome diseases, because of marshes undrained, of houses and cities ill-planned, and of cleanliness ignored or neglected. Have we reason for complaining that our predecessors, when they had as it were the whole world before them, should have settled themselves in malarious localities, and that, when they could have drawn to any amount from the liberal air, they should have so built their houses and streets, as if air were the rarest and most difficult of possessions? No; in judging of their selection we must remember that their primal needs, which became traditional, were to obtain shelter from elemental storms and inclemencies, from wild beasts, and from fierce neighbours, in intrenchments and fortifications, and at the same time to be within reach of the natural food supplied by the sea, by rivers, by forests, by prairies, and by hunting grounds. When, through the clear waters of the Lake of Neufchatel

or of Zurich, we dimly descry the piles of the old Lacustrines, and we wonder that they should have chosen sites for their dwellings seemingly so humid, we have only to call to mind that their sleep was liable to other invasions than that of rheumatic pains, and that the vexatious visits of the smaller tribes of the animal creation could be better borne than encounters with bears and wolves, or surprises from predatory foes.

But however this may be, it is obvious that in the civilized world of nationalities and crowded cities, congregations of men have not to seek choice localities, but to do the best they can towards repairing the effects of the original bad selection, and mitigating the accumulated evils gathered from ages of ignorance and neglect, and from the hard necessities of national struggles. And it is in the attempt to do this that so much energy, and benevolence, and ingenuity have been exerted, in what we call sanitary improvements and sanitary legislation, during the last thirty years. Before this time, however, there was the recognition of such a branch of medical science as had for its object the suggestion or direction of improvements in the public health by means of legislative enactments. Indeed, few civilized nations have been without some laws and customs having for their objects the maintenance of health among the people, the suppression of ordinary diseases, and the averting of pestilences by a sort of police. Among the oriental races there were laws and precepts prescribing and regulating ablutions and baths, the use or avoidance of particular meats, fasts, separation of lepers, definition of the limits of consanguinity not to be transgressed in marriage, and so on. The Egyptians seem to have directed most of their legislative wisdom, as far as health was concerned, to the regulation of the practice of their doctors. Sir Gardiner Wilkinson says "they received certain salaries from the public treasury, and after they had studied those precepts which had been laid down from the experience of their predecessors, they were permitted to practise; and in order to ensure their attention to the prescribed rules, and to prevent dangerous experiments being made upon patients, they were punished if their treatment was contrary to the established system; and the death of a person entrusted to their care, under such circumstances, was adjudged to them as a capital offence. If, however, every remedy had been administered according to the sanitary law they were absolved from blame, and "these provisions," says Diodorus, "were made with the persuasion that few

persons could be capable of introducing any new treatment superior to what had been sanctioned and approved by the skill of old practitioners." The Greeks threw the chief stress of their hygienic endeavours on the education of the bodily frame to the highest degree of vigour and beauty, particularly by the use of gymnastic exercises. How the Romans provided in some important respects for public health may be seen in the picturesque remains of their aqueducts, in their luxurious public baths (in Diocletian's Thermæ there was accommodation for 3,200 persons), and in spacious sewers which date from Etruscan kings. But after all there is little in such arrangements and directions but what might be viewed, more or less, in relation to the most simple demands of the human constitution. It is to this very century, to our own times, nay, I might almost say, to one single generation, that we have to revert for observing any serious practice of public hygiene. I am not about to attempt any history of this movement, but I think I may venture to say its great advances were co-eval with the introduction of the new Poor Law, and with the Act for Registering Births and Deaths and the Causes of Death, and with the Municipal Reform Act, and subsequently with the Act for Amending the Health of Towns. What has been done since that time would require long research and labour even to epitomize it. I will only glance at a very few heads.

The sanitarian professors and practitioners by their zeal, their energy, and enlightened labours compelled our legislature and governments to acknowledge and act upon the fact that oxygen is a substance at least as important as gunpowder; that without the full and free ingress of that life-giving and death-destroying agent into the dwellings of the poor, and that without clearing from thoroughfares and public places accumulated refuse and offscourings, the less favoured classes of the community must sink into lower and lower physical deterioration and deeper and deeper degradation of moral life.

The growth of great cities, the mortality involved in that growth, and the multiplication of feeble, degenerate representatives of the human race, in the alleys and lanes and wynds of those crowded hives, where, though life swarms, disease and death are fermenting and corrupting in increasing ratios, have been well set forth in a paper by Dr. Bridges, on the "Influence of Civilization on Health," in the *Fortnightly Review* for August, as well as previously by Dr. Morgan in his excellent "Essay on the Deterioration of Race by the Increase of Large Cities." It seems that whereas in the year 1811 there were

51 towns containing above 10,000 inhabitants, and these towns contained 24 per cent. of the population; in the year 1861 there were 165 of such towns, containing 44 per cent. In the year 1811 there were sixteen towns containing over 20,000 inhabitants, that is 19 per cent. of the population; but in 1861 there were 72 such towns containing 38 per cent. of the population. In 1811 no town, except London, contained above 100,000, but in 1861, twelve towns had this overflowing population, and they comprised one-fourth of the whole people. The population of large towns is recruited by constant immigration, the calculation being that of the joint populations of London, Liverpool, Manchester, and Birmingham, half of the adult population is immigrant; that is, its nativity was outside of the town, and for the most part in some healthy rural district. Some years ago I compared the mortality of large towns with that of rural districts, and of places with mixed populations, and I found that the average annual rate of the first was 24 in 1,000, in the second 15, in the mixed 21. The crowding of towns implies the accumulation of animal products and exuviæ, and the inability of the population to escape from the polluted atmosphere. The cottage of the agricultural labourer, and even the farm-yard and the farm-house are often woefully deficient in sanitary arrangements, but the inhabitants for the greater part of their time are breathing the fresh air of the fields.

To urge the admission of air, a sufficient supply of water, to avert the pollution of water, to improve drainage, to lighten and purify the dwellings of the poor and surrounding spaces; to induce the public to learn something of the laws of health, and having learnt them to follow their practical corollaries; to press on the consideration of the public mind the value of health, not only for individual and family welfare and comfort but also with a view to public economy, and that reflection of benefit which comes to the upper members of society from the amended health of the less-favoured classes; for such objects and many others the initiators of sanitary reform laboured, in spite of the opposition of local boards, and of municipal and parochial authorities, jealous of any hint that their administration could fall short of perfection; they laboured also undiscouraged by general apathy, and the passive obstruction presented by mere ignorance. To pour knowledge on a gross population, besotted and prejudiced, is like letting sunshine into streets that have been darkened and fouled for ages. The dingy, begrimed surfaces reflect no luminous motion, and through the dusty

apertures and all but opaque windows there can be but imperfect transmission of the light admitted, and so the scene looks after all none the better for the sunshine. But, though the objects of efforts made to enlighten them seem so little capable of appreciating the benefits which await them, the reformers are enabled to discern the dark places on which they have to operate, and to realise what Lord Bacon was never tired of reiterating, that works must be *luciferous* before they can be *fructiferous*, and, as such, imitative of the order of creation, the beginning of which was *Fiat Lux*. But all the zealous endeavours of the early sanitarians would have been longer in overcoming the public indifference had it not been for the epidemics which befell us. The influenzas of 1831 and 1837, and the awful cholera visitations of 1832 and 1849, struck a terror into the people that shook them out of their torpor, and made them consider their ways and their sanitary sins and shortcomings, and disposed their hearts to listen to the sermons and admonitions of the apostles and preachers of hygienic righteousness.

It had been all but useless to explain that ordinary health would be increased, and intellectual energies stronger, and moral emotions and sentiments sounder, and enjoyment more vivid, and all life more bright and vigorous; but it was something to be able to tell them that the destroyers of their dear ones might be warned away, or that if they came the pestilence would be paralyzed, and the fever starved for want of the foul gases and waters by which they were fed and fostered. To this Association, which happily still numbers in its ranks so many of the early labourers in the sanitary movement, it would seem almost impertinent were I to attempt to rehearse their names; but the future historian will dwell on those of Southwood, Smith, Chadwick, Kay-Shuttleworth, Shaftesbury, Farr, Rumsey, Simon, Nightingale, Lankester, Kingsley,* Parkes, Richardson, and Stewart, not only as effecters of the immediate good of mankind in their own day, but also as the inaugurators of happiness to unborn millions. I advise those who wish to inquire into the history of these efforts to study Dr. Rumsey's "Essays on State Medicine," which they will find full of information, sober reasoning, and practical suggestions of the highest value; and also an admirable pamphlet by Dr. Stewart and Mr. Jenkins on the medical and legal aspects of sanitary reform. To these

* We claim the author of Alton Locke and Yeast as a powerful sanitary reformer.

I must add those singularly able letters with which Dr. Farr has for many years enriched the annual reports of the Registrar-General, and which I should like to see collected into a separate volume; also the Annual Reports of the Medical Officer of the Privy Council.

Dr. Rumsey with a masterly hand chalked out lines and parallels for the future extension of sanitary legislation, while Dr. Stewart presented strong statistics and vivid pictures of the good that must accrue to mankind when even the present very imperfect machinery of hygienic improvement has had fair play. But all of these writers afford abundant proof that if we wish to bring out the life and strength of this great people, and to

> "Cleanse its foul bosom of that perilous stuff
> That weighs about its heart,"

we must have more efficient machinery and a greater number of workers. They must be men accomplished in the sciences that belong to this Department, and also men who have had thoroughly practical training. Their occupation must be the care of the public health, and of that only. They must be above the control, and independent of the appointment, of local boards, for there must be neither favour nor fear in their relations with local authorities and with local possessors of property. If they are thought to strain their power, and to encroach too much on public finances, that is, on local rates and taxes, let them be amenable to censure and restraint from the hands of the national administration. It is extremely difficult for locally appointed inspectors and local boards to do their duty when they have to deal with the dwellings of the poor. They come into conflict with individual interests, often with the interest of persons powerfully influential in the locality. But there are a vast number of subjects that would fall under the care and control of such state officers, who would have no other duties to perform than those which belong to their special office. There would be no struggle between the claims of public work, ill paid, and those of private engagements which are the main dependence of the officer for subsistence. The interests of the public would not be subject to the fortunate accident of alighting or not on an able and assiduous agent like Mr. Davis of this city, who has zeal and activity enough to combine successfully both public and private duties. The work of such an officer as we have indicated would comprehend not merely the inspection of the dwellings and lodging-houses of the labouring classes, and streets and thoroughfares; but rivers and water-

courses, also workshops, factories, and mines would come under his survey. Again, he would have to watch the public market-places, the stall of the seller of fruit and vegetables, the shambles of the butcher, the shops of the vendors of possibly adulterated food and adulterated drugs, in fact, all places where refuse may accumulate and noxious products arise, and whence deleterious substances may be disseminated. The registration of births and deaths might or might not fall to his lot, or to that of some other medico-legal functionary; but certainly it would be his duty to watch the progress of sickness in the population, not merely as measured by death rates. His work, like that of this Association, would be to prevent or reduce the deadly records of the public registrar, and with a view not only to save life but also to make life happier and more useful.

The great misery of the world is not dying, but dragging on a maimed, mutilated existence, in which labour is suffering, and pleasure is a burden and disappointment, a state without spring, and without light or colour, or at best a dull monotonous *chiaroscuro*, which, if not distressing, is utterly joyless. Yet to vast multitudes life is nothing better, because, in the districts inhabited, the fountains of life are inadequate, or are adulterated and poisoned. We cannot very much wonder that the artizan, dulled and half-stupified by the close air and ill odours of the workshop and the lodging, or by the fumes of the factory, should reel into the cheerful beer-house or the glittering gin-shop, craving for some temporary relief to his weariness and depression. I need scarcely remark *en passant* that one of the most crying wants of the community, with regard to public health, is provision for unobjectionable amusement. In supplying their needs it is not enough to give them oxygen in plenty, and pure water and wholesome food: they have to be entertained as well as fed. Recreation and play are as necessary to mankind as are food and raiment. And if there are not sources of rational and innocuous amusement, then there will inevitably be riot and debauchery. An enlightened and refined community will some day provide for these things. It will not, as of old, be left to self-seeking, ambitious consuls and emperors to corrupt the people with "*panem et circenses;*" but governments will keep a paternal eye over the sports and amusements, as well as over the health and the toil of the great mass of the community. Here, however, we are encroaching on other Departments. But indeed it cannot be otherwise than that the Departments should occasionally overlap each

other. The mind and the body, the body and the mind; the laws that bind, and the laws that loose; the knowledge that strengthens and enlivens; and the economy that provides and husbands the resources of life and strength; all of these in their several requirements and operations are perpetually crossing and interpenetrating each other as the unavoidable result of the compositeness of man's constitution, and of its correlative wants.

But to return to our immediate subject, I must trouble you with a few more words on State medicine. There are probably many members of this assembly who have not followed the course of the movement. Four years ago a committee was formed by the British Medical Association for the special object of taking means to urge upon the Legislature the importance of providing for the more effectual administration of the laws affecting public health, and for the amendment of medico-legal action. The subject was also taken up by this Association. In the early part of last year the movement had advanced so far that a joint committee, which had been formed, by a happy suggestion of Mr. Hastings, from this Association and from the British Medical Association, recommended a deputation to the Government in order to petition them to appoint a Royal Commission to inquire into the operation of the laws belonging to State medicine. The deputation was made, and one of the points most strenuously urged on the Government, was the necessity of appointing a new order of functionaries in the State, who should be distributed over the country with the special duty of advising, directing, and, if necessary, of enforcing the administration of the laws affecting public health. The heads of recommendation were:—

"1. The manner in which the cases and causes of sickness and of death are, and should be inquired into, and recorded in the United Kingdom.

"2. The manner in which the coroners' inquests, and other medico-legal inquiries are, and ought to be conducted, particularly in the methods of taking scientific evidence.

"3. The operation and administration of sanitary laws with special reference to the manner in which scientific and medical advice and aid in the prevention of disease are, and should be afforded; and also with special reference to the extent of the areas or districts most convenient for sanitary and medico-legal purposes.

"4. The sanitary organization existing and required, including a complete account of the several authorities and officers. The education, selection, qualification, duties, powers, tenures, and remuneration of the said officers to be specially reported on.

"5. The revision and consolidation of the sanitary laws, having special reference to the increase of the efficiency of their administration both central and local."

For this work we are indebted especially to the exertions of Dr. Rumsey, Dr. Acland, Dr. William Farr, Dr. Stewart, Mr. Clode, and Mr. Michael. The Royal Commission has been granted, but it is to be regretted that the Government has thought proper to limit its operation to the provinces of England, for even if Scotland and Ireland were not to be included, it was undesirable that the metropolitan districts should have been omitted. I do not suppose that London is held to be too pure to be inquired into, or that, although some of its sanitary provisions are all that could be wished for, especially those which are under the supervision and control of such officers as Mr. Simon, Dr. Letheby, Mr. Holland, and Dr. Ballard, there is no room for the operation of that new order of functionaries, the creation of which we are so anxious to urge on the Legislature, and which we trust will be the result of the inquiries of the Royal Commission.*

* The last action of the joint committee in their untiring performance of the duties which they had undertaken was this memorial:—

"*To Her Majesty's Principal Secretary of State for the Home Department, and to the Right Honourable the Chancellor of the Exchequer.*

"The Memorial of the Joint Committee of the British Medical and Social Science Associations,

"Humbly Sheweth,

"That the primary and chief object of those who last year earnestly urged upon Her Majesty's Government the appointment of a Royal Commission of Inquiry into the operation and administration of the Laws relating to Registration, Medico-Legal Investigations, and the Improvement of the Public Health, was to obtain, on unimpeachable authority, the fullest and most trustworthy information as to how far the Laws in question are fitted to secure the ends for which they were enacted, and how far they are obeyed throughout the United Kingdom of Great Britain and Ireland. That they hoped and believed that such an Inquiry, properly carried out, would furnish a body of evidence that would be accepted on all hands as a safe guide in all future discussions on the consolidation and amendment of the said Laws, and might be appealed to as conclusive, both in and out of Parliament.

"That they asked for an Inquiry co-extensive with the Kingdom, because, while the spirit and general tenor of the said Laws are everywhere the same, the details are very varied, and marked by diversities, sometimes well and often ill suited to the circumstances under which they are administered. That, therefore, any legislation founded on imperfect information as to these special circumstances and the special means required to meet them, must of necessity fail to fulfil the intention of a Sanitary Commission, and to secure those benefits which would be likely to result from fuller and more extended Inquiry.

"That no information obtained merely by written answers to schedules of questions, always open to grave misconception of their scope and import, and addressed exclusively to local authorities, can, in the absence of personal inquiry, either by the Commission itself or by skilled persons deputed to discharge their functions, furnish a trustworthy basis for permanent legislation. That as, sooner or later, recourse must be had in many places to inquiry on the spot, in order to supplement the tabular returns, as well as to test their accuracy, economy as well as efficiency demands that this course be adopted now.

"That the urgent necessity for a full consideration of the present method of

But while Government and the Legislature are awakening to the duties which lie before them, it is to be hoped that they will be supported, and indeed urged on, by public opinion; and one of the instruments for increasing the public interest in these vital matters is the Social Science Association. It cannot be said that the public does not altogether need to be instructed or roused to a sense of its wants and its dangers, when we read in some of the journals that it is highly doubtful whether vaccination should be compulsory, and that vaccination is little better than a fancy or theory of the medical profession. But the history of small-pox in different countries, since vaccination was discovered and practised, would bring any impartial inquirer to the belief that, if this safeguard were neglected, the community would in another generation or two go back to that state which used to cause the writers of public advertisements, and private correspondents, to describe individuals as distinguishable by their complexions, in regard to the marks left by the ravages of small-pox. It would seem that a semi-panic has been excited by a report that cases have occurred in which there was reason for suspecting that the virus of disgusting and deteriorating disease had been diffused by vaccination. Even were it admitted that a constitutional fault, inherited from vicious parentage, can be communicated through the vaccine lymph, still all that we have to be anxious about is the selection of proper sources of the lymph. We do not leave off eating bread because bread is sometimes adulterating.

And as to the infraction of the liberty of the subject by compulsory vaccination, it must be borne in mind that our object in forcing vaccination on parents is not so much that their offspring should be preserved from small-pox, as that their children may not become the contaminators of their neighbours, and perhaps of the whole community. Those who can remember, as I can, the time when the

conducting medical investigations in relation to forensic tribunals has been, much to the regret of your Memorialists, entirely lost sight of, and excluded from the Inquiry of the Commission.

"Your Memorialists, therefore, would most respectfully urge on Her Majesty's Government a further prosecution of these inquiries, and their extension to the metropolis, to Scotland, and to Ireland. This, although entailing some additional outlay, would amply repay, in value to the country, any contemplated expenditure of national funds; and would insure that confidence in the investigations of the Royal Commission which the present limitation of the Inquiry fails to command.

"Signed in name and by appointment of the Committee,

"*London, August*, 1869." "W. H. Michael.
"A. P. Stewart.

nation was just realising the benefit of Jenner's transcendent discovery in the new sense of security to life, and, I may add without any hyperbole, in the renaissance of the beauty of men and women; those who can remember that time, and the infinite labour expended in reasoning and preaching, and pleading, and persuading a doltish and prejudiced people to profit by the beneficent light which, through a genius all but divine, had been flashed upon them; those who can remember the hard emergence of human life and human beauty from that period of desolation and disfigurement, are shocked by the pernicious levity with which doubts are now thrown upon the value of vaccination, the most precious boon that any one man ever conferred on his fellows.

I may state that since I put down these words, I have read a report of a quite recent discussion, in the French Academy of Medicine, of this fear of contamination from cow-pox; and I am glad to say that the result was enormously preponderant against the alarmists. And so I trust that compulsory vaccination will not give an inch to this foolish and petulant opposition.

In the course of these remarks I have talked of health, both individual and public, as if it were well known what health means. Perhaps the common popular notion of it is enough for practical purposes. It is the antithesis of disease and disability, the capability of doing the duties of the day without detriment to the organs employed in the work, or to other parts of the body. It is not health for example, if the brain of the literary man after the production of a successful paper is left aching, and if his night's rest is broken, and his digestion becomes toilsome, and his muscles are unable or unwilling to act. Perfect health—ideal health—implies the completeness of the whole and of every part of the human organism, the eduction of all its latent capacities in their due proportion to each other, and such a condition of all the parts that they may do what is fairly required of them without strain, and without subtraction from the energies of each other. To attain this is the aim of hygienic art;—to develop man to the utmost of his physical nature, and yet to maintain the several parts of his system in due balance and harmony. A grand object, but alas! far from attainment. To many it seems that there is nothing needed but to let nature take her course—to follow nature, to obey natural laws, and then that all will come right. But this is a some-

what shortsighted view. It is too true that man has often blundered and bungled in his attempts to modify and subdue the forces of nature so as to realise his conceptions and to satisfy his wishes, and that after his clumsy contrivances and manipulations he has had to throw up his schemes and endeavours, and to admit that nature's processes are better left to themselves. But if the human race had continued to be deterred by such discouragements, there would have been no art, no progress. Man cannot resist his destiny, which is involved in his faculty to mould and subdue nature to something better than he finds around him. One of his great difficulties is that he has to work in a limited time, and with the most rigid economy in the use of what he works with, and of the matter on which he works. But nature has unbounded resources; to her time is no object; and she has unlimited means of waste as well as of use, and the achievment of her perfection after all may be left to the struggle of the strongest, and the chance meeting of the fittest structure with the fittest environment; in the course of which trials and contentions, and selections and adjustments, there may have been centuries on centuries of incompleteness and waste. Sickly, stunted plants, crowded trees destroying one another, flowers with imperfect petals and shrivelled leaves, are some of the commonest indications of natural want of development, of overcrowding, of imperfect supply of heat and moisture—in a word, of what in human arrangements would be disease and would imply neglect.

These facts of course belong to an order of events which are beyond the limited cognisance of man, a system by which decay, and waste, and death are but phases of transmutation, and media through which better things are to be evolved. Were man merely to follow nature, he would, on looking at the present state of his fellows and of society, be inclined to say:—These agricultural peasants seem but very poorly developed, with narrow perceptions and the scantiest knowledge, and even their locomotive frames, though trained to some kinds of rough toil, are yet wanting in suppleness, and elasticity, and grace; these pallid, crippled artizans in these overgrown towns, these poisoned infants, these distorted, half human arabs of the streets, these unhappy fallen women, these demons of debauchery, these rotten haunts of crime and infamy,—they must be left: these evils must cure themselves by plagues, and deaths, and desolations, and better and wiser races will in far-off times emerge. But man, if he thinks at all on such

things, cannot by the very necessity of his nature, his instincts, his yearnings, his sympathies, his conscious power, he cannot let the evils which he sees pursue their course; he cries—

> "Must helpless man in ignorance sedate
> Roll darkling down the torrent of his fate?"

and forthwith he begins his attempts at civilization and improvements.

In regard to health, there are agents all around that feed, and support, and purify, but they need to be arranged and used according to knowledge and reason; and here is the difficulty. The perceptive and reasoning faculties of man are as much a part of nature as whatever he surveys and operates upon. But this part of nature may be for long ages in abeyance, latent, and unevolved; or it may be employed on very different agents, as, for instance, in the transactions of war, and in works which give pleasure to the eye, and which belong to the fine arts. Hygienic art cannot be practised without study of nature, nor without altering nature and compelling her to subserve and minister to the health of individuals and of communities. It is but doing in its own sphere what all civilization does in violating and breaking up the works of nature. If we consider for a moment a scene of tropical vegetation; magnificent forests, luxuriant underwood, beautiful plants, birds of gorgeous plumage, and sweet voices; we are disposed to exclaim, "how glorious and how admirable are these works!" though we know that these plants and trees often strangle and stifle each other, grow imperfectly, and die prematurely; and that within the thickets lurk murderous carnivora, and treacherous reptiles, and hideous mollusca, and venomous insects, and slimy annelida, loathsome and repugnant to all but enthusiastic zoologists; and that were there not these animal foes of man, there are malarious poisons lying in wait for him, if he is so ignorant or unwary as to attempt to take a night's repose in those solemn and enchanting shades. In the course of time man learns that there are many things that he must alter and destroy. He must let in light and air, and kill or starve the beasts and reptiles, and sweep away the woods, and drain the jungles. And in his civilizing works he does this and much more. But in all his observations, and thinkings, and labourings, it is only the nature within him contending with and subduing the nature which is around him. So that after all there is no antagonism of nature and art, but the triumph of one department of nature over another, the yielding of the lower nature in gross physical forces, and inferior living organisms, to the higher

nature which is in the will and reason of the supremest of God's creations.

On glancing over the recent literature of public health, monographs, reports of the Registrar-General, reports of health officers, addresses from this chair, papers in journals, &c., unless you follow up one particular inquiry a benumbing sensation comes over you of confusion and bewilderment. It is as if one suddenly entered upon a vast district of primeval country, where an army of pioneers and engineers, miners and quarrymen, had been recently set to work to level and clear and irrigate, with a clamour of tongues—some querulous at the impracticability of the soil, some denouncing the methods employed, some crying for additional help. But in whatever direction we look we may discern evidences of earnest labour and successful effort. In fact, the great work of our age is just beginning. We are "in the morning of the times," nay, in the earliest, faintest dawn, and some confusion and distraction are inevitable. We have so many unsettled questions. We hardly know, taking, for example, even a practical matter, anything so seemingly rudimentary, as whether we should pour the refuse of our towns into rivers, or detain it both for the service of the land and for the preservation of water from pollution. And, as an instance of scientific difficulty and uncertainty we are by no means clear, and therefore by no means agreed, as to the manner in which great sanitary evils beget diseases, how epidemics and plagues and pestilences originate. We know certain gross facts, we know that diseases are rifest and their deadliness heaviest where human beings are in closest proximity; we know that a certain consumption of oxygen is effected by one pair of lungs in a certain time, but varying with food, and different kinds of food and exercise (though there is a controversy as to the number of cubic inches of air to be allotted to an individual in a cell or dormitory), and we talk of air poisons, and water poisons, and earth poisons, but we do not really know what they are. What is marsh miasm? What is the contagious substance, the *causa causans*, in small pox and scarlatina? Are they living or dead things? Are they organic germs, capable of indefinite self-multiplication when once embedded in an appropriate nidus? or are they new combinations of proximate principles, generated out of the death, decay, and disintegration of organic matter under particular conditions? The decision is not come to.

And there are epidemics about which it is not settled whether they

are propagated by contagion only, or by other means; or whether, owing their origin only to earth, air, and water, and organic matter, they are afterwards sown among a population by the first victims. To some it appears as heterodox to believe in a mere chemical, septic origin of typhoid fever or cholera, as to believe in the equivocal or spontaneous generation of the lowest forms of life. The anxious, eager thoughts of inquirers fume and ferment over these questions in a zymosis as energetic as the hypothetical process which one section of the controversialists attribute to the object of their researches. But under the vigilant outlook and investigations of combined chemical and microscopic detectives, the latent offenders will some day be brought to light and their mysterious genesis unmasked. Where there is so much room for guessing, I might not be seriously blamed for surmising that it is not improbable that the so-called poisons, though forms of life, and sprung from a remote ancestry, may, like other organisms, have undergone Darwinian metamorphoses in their long descent; that varieties have been constituted into species; that the *nova febrium cohors*, which suddenly alighting on a population, perplex and affright it with novel forms of havoc and desolation, may be transformed descendants of ancient enemies of man; that the plague of Athens in one age and country is in another the plague of Egypt, or the black pestilence of the Middle Ages, or the sweating-sickness of the Renaissance, or even the cholera of the second decade of the present century. But whatever the vagueness of our conjectures, the wildness of our speculations, or the strife of our controversies, it is a consoling fact that our scientific sanitarians can, in many cases, destroy the substances in which the invisible agents of evil lie dormant, whether by making their habitats untenantable, or incapable of maintaining their noxious life, or by chemically decomposing them as mere morbific matter. An admirable contribution to the science of disinfectants and to the art of using them has been given to the public in the present year by Dr. Angus Smith; and I cannot but add that my distinguished friend, Dr. Budd, who has devoted so much ability and so much toil to the elucidation of contagious diseases, has favoured the public with some valuable practical directions on the means of guarding against infection from scarlatina.

In the work which this Department undertakes there is, as I have said, much confusion and darkness, but we need not doubt that, as in

all honest scientific inquiries, and strenuous endeavours of art, endeavours founded on knowledge, the great forces of Nature will be brought to act on the side of human wants, and that the seeming hostilities will be limited and subdued by human will. It will not always have to be said that—

> "The generations are prepared; the pangs—
> The internal pangs are ready; the dread strife
> Of poor humanity's afflicted will,
> Struggling in vain with ruthless destiny."

It would be scarcely presumptuous to prophesy that as men become really wiser they must become happier. By wiser I do not mean more merely speculative and contemplative. In the matters under our survey, to be wise is to learn and to make others learn and know the facts of nature; that is, the facts of our human life and of the things or agents that surround and affect us, our existence and the conditions of our existence, and then to apply our knowledge to the promotion of the greatest happiness of the greatest number of the human race. As it regards health, men as they become better instructed in the composition, and physics, and chemistry of their bodies, and in the relation of corporeal processes to the powers of nature, will take more heed to all that comes under hygienic culture, and they will learn far more than we in this age can know; for our inquiries, as I have just remarked, are only on the threshold. The narrow life which is now led by mankind will, perhaps, be exchanged for one in which they will have wider ranges, and a "*largior æther*." The means of traversing the globe will be multiplied and facilitated, and the human family will be more equally distributed; races arising in adaptation, and capable of making their environment conformable to their needs. Science will in time teach a production and economy of food to which present processes will seem rude and barbarous. The resources of the healing art will be immensely increased. But it requires strong faith in the ultimate triumph of good if we venture to hope that the causes of hereditary diseases will decline and die out, that new modes of living, and new political and social developments will eventuate in the growth of stronger and higher human types, which types will become dominant, and either transmit robuster and sounder frames, and more powerful faculties, or at least become the objects of that passive imitation which has been believed even in historic times to have

insensibly moulded nations into finer forms, with grander aims and larger capacities.* One of the strangest and saddest of the necessities of our present degree of civilization will, long before such a state of things, have fallen into desuetude; for we must call it a necessity in the present state of the world, with its present ways and opinions and practices: I mean that which fills the columns of newspapers with experiments on explosive compounds, that have no other object than the destruction or mutilation of that which this Association takes under its special thought and care. That there should have been co-eval with this society such institutions, for example, as the Ordnance and the Admiralty, will seem in other ages an unintelligible anomaly. Nearly two thousand years ago it was said "*si foret in terris rideret Democritus*," but how inextinguishable would be the laughter of that resuscitated sage if, after we had commanded his reverent and admiring attention to an exposition of the religion of the Sermon on the Mount, and after we had assured him that this religion had been publicly professed in these realms for more that a thousand years, we should then take him on one of our grand days to Shoeburyness! Let us hope that the removal of this woe and disgrace of nationalities may pass away even faster than can grow the developments of our race, and the abatements of the evils which press us down, and call for the efforts of this present Society. Yet they will require long, long years, ages on ages, *sæcula sæculorum*. Many "heroes and poets, and prevailing sages," may have to go to their graves, leaving "the vesture of their majesty to adorn and clothe this naked world," perishing, but bequeathing anticipations and dreams of a better earthly life, and of nobler thought and action—

> "Whose forms their mighty spirits did conceive,
> To be a rule and law to ages that survive."

Many such will have come and departed before the human destinies have fully culminated. If the thought of so long a delay inclines us to join in the old lingering cry, "Quousque Domine?" we must call upon our imaginations to conceive the lapse of ages between the existence of the primeval prehistoric tribes, I will not say of the contemporaries of the cave bear and the mammoth, but even of that great family whose speech and whose traditions were the germs of the languages and the mythi of the Indo-European nations—those strong,

* See an interesting essay on Physics and Politics, by Walter Bagehot, Esq., *Fortnightly Review*, July, 1869.

brave men, who lived before Agamemnon, lost in a long night of oblivion, unknown and unwept because unsung, and only in these latter days descried like ghosts by the penetrating sight of a Max Müller; we must imagine the innumerable eras which have revolved between theirs and that of Cuvier, Herschel, Stephenson, Faraday, Brougham, Lyell, and Tennyson. But there is no necessity for projecting an equally slow rate of progress from our present stage of development to that which is to come; for it is in the nature of civilization, unless checked by cataclysmal events, to advance in a geometric ratio. And at all events we cannot easily suppose that our earth will have lost her heat or our sun have ceased to burn, before man has experienced and enjoyed the perfect evolution of all those capabilities and faculties with which his Maker has endowed him, before all that is now only potential and latent has come out into form and action. Towards such a consummation the work of this Society is tending. Its success may be but small, and that glorious end may be never reached; but we may take heart and comfort from the knowledge that its immediate operations are helping to increase the amount of happiness and moral good in the world, and to take away some of its evil and its suffering. And so aiming, and so working, we may devoutly say—God speed it.

POEMS.

A PHILOSOPHER'S PSALM.

GOD! whom I distantly revere,
Help me to know and feel thee near;
Awestruck thy works and laws I trace:
Would that my spirit felt thy grace!

In clearest deep-cut characters
Nature thy authorship avers;
Her miracles are thy design,
Her arts, her inspiration thine.

That page I see, that text I read,
No commentary's gloss I need;
A finer, subtler force impart,
Writing thy law upon my heart.

Oft have I gazed around and mused,
Seeing thee everywhere diffused,
Within, without, below, above,
Vast circumflux of power and love.

But yet not mine thy love I call,
Not mine, if but a part of All;
The fly, the flower, the worm, the clod,
These all are circumfused with God.

A voice my spirit's depths within
Cries, "Surely I am more akin—
Atom of man's divinity,
I claim with God affinity!"—

Nor claim I only as a man,
Or one of Japhet's lordly clan,
But from my individual soul,
The oneness of my personal whole.

The stars that gem the vault of night,
Make up one universe of light;
But not the less each several star
Shines separate and singular.

But higher far my claims aspire
Than orbs of gross material fire;
A microcosm in me lies,
Embracing all the entities,

In worlds beneath, above, around,—
From Heaven's high pole to earth's profound:—
I fathom seas, I measure suns,
And count how fast their radiance runs:

And all that *has* been, on my brain
By History's pen is written plain;
And all that *might* be, Verse makes mine,
Singing in sweet notes sibylline:

And all that's seized by eager sense,
Or held by strong intelligence,
Is mine, with many a mystery
Laid bare by new philosophy.

Vain boast!—This lore, oh Lord, I find
Thrown on the mirror of my mind:
A mirror moulded by thy skill,
Which thou canst blur or break at will.

Help me to learn thy better lore!
For this I'd fain all else ignore;
That highest wisdom make thou mine
To know no other will than thine;

To see in Christ thy Godhead given
For man to mark twixt earth and heaven,
His faith transcending petty creeds,
And love that lived in loving deeds.

That life when man can imitate,
He'll triumph over Time and Fate;
And seeing sin and hatred driven
From earth, find earth transformed to Heaven.

VERSES

IN THE VALE OF BEDDGELERT.

Time was—and for that time full oft I yearn,
When sights and sounds which cheered or soothed my soul
In many a lyric vision would return,
In many a tuneful echo backward roll.

Not shattered was my lamp;* its flame unfanned
Waxed dim, for other cares compelled my will:
Not broken was my lute; only the hand
That woke its chords hath lost its little skill.

Ah, happy days! Ah, happy dreamful time!
When all the world of sense was steeped in hues
Caught from Imagination's airy clime,
Then fixed for ever by the faithful Muse.

* Alluding to Shelley's well-known lines:
"When the lamp is shattered."

God's will be done! He gives—He takes again!
His gifts I would resign without a sigh;
I would not weep o'er Fancy's faded reign,
Nor mourn my long-lost spells of poesy;

Could I but feel my reason's eyesight clearer,
My will less warped or won by fond desire,
The good of others, not mine own, grown dearer,
My faith made firmer and my hope set higher.

God grant these gifts! so shall I then behold
Thy world in truer light, a light from Thee!
Fairer than Fancy's feigning words e'er told,
And heralding the world that is to be!

SHADOWS.

Oh the shadows—the beautiful shadows,
Floating far o'er the hills away;
As over the sky
The light clouds fly,
So o'er the mountains wander they.

Oh the shadows—the beautiful shadows,
Sleeping soft on the meadows green;
Fair are the flowers
In sunbright bowers,
But fairer the flowers those shades between!

Oh the shadows—the beautiful shadows,
Dancing light on the ocean spray;
Changing each wave
From gay to grave,
Like the frowning smiles of a child at play.

Oh the shadows—the beautiful shadows,
  Sinking deep in the moonlit lake;
    Where the mountains seem
    As if view'd in a dream,
And a world of purer beauty make.

Oh the shadows—the beautiful shadows,
  In the world without and the world within;
    For joy may borrow
    A charm from sorrow,
And charity smile on repentant sin.

Oh the shadows—the beautiful shadows,
  Falling soft on the dazzled vision;
    When the tender thought,
    By memory brought,
Tempers the glare of hopes Elysian.

And there are shadows—merciful shadows,
  Dropping like balm on the bleeding heart
    When first it knows
    That love's flame glows
Stronger and purer when joys depart.

Then bless the shadows—the beautiful shadows;
  And take this thought as you gaze abroad;
    That in heaven and earth
    Shades owe their birth
To Light—and Light is the Shadow of God.*

* *Lux umbra Dei*—an old Platonic notion.

THE BROTHERS.

[The elder fell in the first onset at the battle of the Alma; the the younger died of cholera, one month afterwards, before Sebastopol.]

I.

Sleep on! sleep on! ye beautiful and brave!—
Where late the cannon's boom
Thunder'd its voice of doom;
Where late your charging cry
Rose o'er the rattling musquetry;
All now is still, save Alma's rippling wave;
Sleep on! sleep on! ye beautiful and brave.

II.

Soon was thy warfare ended, thou young chief!
No weary, fitful story
Of years of toil for hours of glory;
From off that field, thy first and last,
Thou at one bound hast pass'd
To fame! Ah, Fame, thou cheerest not our grief;
Pale are the brows and cold, where twines thy laurel-leaf.

III.

They saw Death beckon from the fierce hill-side,
As by the camp-fires' light
They watch'd that dreary night;
But when the morning broke
On a hundred batteries' blaze and smoke,
With bounding hearts they clear'd the shot-lash'd tide,
Sprang at the cannon's throat, and wrestling died.

IV.

Sleep! calmly sleep! ye beautiful and brave!
By sacred lips the words are said,
Which soothe the living, bless the dead;
Heroes are buried where they fall,—
No funeral pomp or pall,—
A warrior's cloak is all;—
With this a brother in true soldier's grave
Folds the lov'd form he would have died to save.

V.

Sleeps now that brother, too—yet sleeps not there:
O cruel, fatal Chersonese!
Insatiate War! Must fell Disease
With Slaughter join to feed
Thy ever-growning greed?
The siege drags on; valour in vain may dare;
Weapons are mould'ring in the sickly air;
Reckless of shot and shell, ev'n lightest hearts despair.

VI.

Past is your pain and peril: sleep, ye brave!
Glory is yours, and rest!
But many a gentle breast
Shall shudder at your tale,
Many a blooming cheek grow pale;
While Faith shall turn bereav'd eyes from the grave,
To Him who only taketh what He gave,
Whose Holiest came to suffer and to save;
In Him sleep on! ye beautiful and brave!

ON A PICTURE BY NICHOLAS POUSSIN.

Et ego in Arcadiâ vixi.

Ah, happy youths! ah, happy maid!
Take present pleasure while ye may;
Laugh, dance, and sing in sunny glade;
Your limbs are light, your hearts are gay;
Ye little think there comes a day
('Twill come to you, it came to me,)
When love and life shall pass away,—
I too once dwelt in Arcady!

Or listless lie by yonder stream,
And muse and watch the ripples play;
Or note their noiseless flow and deem
That life thus gently glides away,
That love is but a sunny ray
To make our years go joyously;
I knew that stream, I too could dream,—
I too once dwelt in Arcady!

Sing, shepherds, sing! sweet lady, listen!
Sing to the music of the rill!
With happy tears her bright eyes glisten;
For as each pause the echoes fill,
They waft her name from hill to hill.
So listened my lost love to me;
The voice she loved has long been still,—
I too once dwelt in Arcady!

PROMETHEUS.

The lamented Sir James Simpson *was the subject of angina pectoris.*

I.

"Ah me! alas! pain, pain, ever, for ever!"
So groaned upon his rock that Titan good,
Who by his brave and loving hardihood
Was to weak man of priceless boons the giver,
Which e'en the supreme tyrant could not sever
From us, once given;—we own him in our food
And in our blazing hearth's beatitude;
Yet still his cry was "pain, ever, for ever!"
Shall we a later, harder doom rehearse?
One came whose art men's dread of art repressed;
Mangled and writhing limbs he lulled to rest,
And stingless left the old Semitic curse;
Him, too, for these blest gifts did Zeus amerce?
He, too, had vultures tearing at his breast.

II.

Hush! Pagan plaints, our Titan is unbound,
The cruel beak and talons scared away;
As once upon his mother's lap he lay,
So rests his head august on holy ground;
Spells stronger than his own his pangs have found;
He hears no clamour of polemic fray,
Nor recks he what unthankful men may say;
Nothing can vex him in that peace profound.
And where his loving soul, his genius bold?
In slumber? or already sent abroad
On angel's wings and works, as some men hold?
Or waiting Evolution's change, unawed?
All is a mystery, as Saint Paul has told,
Saying: "Your life is hid with Christ in God."

March 13, 1870.

TRANSLATIONS.

FROM MIMNERMUS.

Τίς δὲ βίος;

WHAT'S Life or Pleasure wanting Aphrodite?
When to the goldhaired goddess cold am I,
When love and tender gifts no more delight me,
Nor stolen dalliance, then I fain would die.
Ah fair and lovely bloom the flowers of youth;
On men and maids they beautifully smile;
But soon comes doleful eld who void of ruth
Indifferently afflicts the fair and vile;
Then cares wear out the heart; old eyes forlorn
Scarce reck the very sunshine to behold;
Unloved by youths, of every maid the scorn,
Such the hard lot God lays upon the old.

Τιθωνῷ μὲν ἔδωκεν.

Zeus to Tithonus gave a grievous ill,
Undying age, than death more horrible.

FROM THEOGNIS.

Μοῦσαι καὶ χάριτες.

Muses and Graces! daughters of high Jove,
When erst ye left your glorious seats above
To bless the bridal of that wondrous pair,
Cadmus and Harmonia fair,
Your voices pealed a divine air:
"What is good and fair
Shall ever be our care;"
Thus the burthen of it rang,
"That shall never be our care
Which is neither good nor fair"—
Such were the words your lips immortal sang.

ἡμεῖς δ'ἐν θαλίῃσι.

Let us in life's delights serenely share,
While yet 'tis ours to feel how sweet they are;
Swift as a dream our glorious youth goes by,
Fleet as the coursers that to battle fly,
Bearing the chief with quivering spear in hand,
Madly careering o'er the rich cornland.

ἄφρονες ἄνθρωποι καὶ νήπιοι.

Vain thoughtless men! lament ye death's fell power?
Yet shed no tears o'er youth's decaying flower?

ὤ μοι ἐγὼν ἥβης.

Ah me! my youth! alas, for eld's dark day!
This comes apace, while that fleets fast away.

FROM THE GREEK ANTHOLOGY.

οὐ γάμον ἀλλ' Ἀΐδαν.

Poor Clearisté loosed her virgin zone
Not for her wedding, but for Acheron;
'Twas but last eve the merry pipes were swelling,
And dancing footsteps thrill'd the festive dwelling;
Morn changed those notes for wailings loud and long,
And dirges drown'd the hymeneal song;
Alas! the very torches meant to wave
Around her bridal couch now light her to the grave!

εἰς Ἀΐδην ἰθεῖα κατήλυσις.

Straight is the way to Acheron,
Whether the spirit's race is run
From Athens or from Meroë:
Weep not, far off from home to die;
The wind doth blow in every sky,
That wafts us to that doleful sea.

οὐκ ἔθανες Πρώτη.

Thou art not dead, my Proté! thou art flown
To a far country better than our own;
Thy home is now an Island of the Blest;
There 'mid Elysian meadows take thy rest:
Or lightly trip along the flowery glade
Rich with the asphodels that never fade!
Nor pain, nor cold, nor toil shall vex thee more,
Nor thirst, nor hunger on that happy shore;
Nor longings vain (now that blest life is won)
For such poor days as mortals here drag on;
To thee for aye a blameless life is given,
In the pure light of ever-present Heaven!

τῇδε Σάων.

Here lapped in hallowed slumber Saon lies,
Asleep, not dead; a good man never dies.

οὐκέτι θελγομένας, Ὀρφεῦ.

Orpheus! no more the rocks, the woods no more,
Thy strains shall lure; no more the savage herds,
Nor hail, nor driving clouds, nor tempest's roar,
Nor chafing billows list thy lulling words;
For thou art dead: and all the muses mourn,
But most Calliope, thy mother dear.
Shall we then, reft of sons, lament forlorn,
When e'en the Gods must for their offspring fear!

αἱ τρισσαί ποτε παῖδες.

One day three girls were casting lots in play,
Which first to Acheron should take her way;
Thrice with their sportive hands they threw, and thrice
To the same hand returned the fateful dice;
The maiden laughed when thus her doom was told:
Alas! that moment from the roof she rolled!—
So sure is Fate whene'er it bringeth bale,
While prayers and vows for bliss must ever fail.

ὑφικομὸν παρὰ τήνδε.

Come sit you down beneath this towering tree,
Whose rustling leaves sing to the zephyr's call;
My pipe shall join the streamlet's melody,
And slumber on your charmed eyelids fall.

γυμνὴν εἶδε Πάρις με.

Three have seen my beauty zoneless,
Three I know, but only these,
Anchises, Paris, and Adonis;
But when didst thou, Praxiteles?

Πάλλας καὶ Κρονίδαο.

Pallas and Jove's haughty bride
Came down to see our Cnidian Venus;
"We wronged the Phrygian boy," they cried,
"Not falsely did he judge between us!"

FROM HORACE.

Carm. I. 38.

Boy, I dislike this Persian frippery,
These linden-twisted chaplets please not me,
Pray take no pains to find for me where grows
The latest lingering rose.
Twine not the myrtle spray with studious care,
Plain myrtle leaves we both may fitly wear,—
Thou as my page, I as I sip my wine
Beneath my thick-leaved vine.

Carm. II. 3.

In trouble keep your courage high
And calm, but yet in happier fate
Be not with rapture too elate—
For one day, Dellius, you must die.
Whether through dreary days you pine,
Or on the far sequestered grass
Luxurious holidays you pass
Quaffing your old Falernian wine:
I know the spot—by poplar pale
And lofty pines a friendly shade
With intertwining branches made;
And hard by struggles through the vale
The winding water:—there we'll set
Wines and rich perfumes; boys shall bring
Roses too briefly blossoming;
While Youth and Fortune smile, while yet
Their dark threads spin the sisters three.
Ah me! your parks, your pleasant home
Washed by the Tiber's tawny foam
You'll leave; and all your wealth shall be
But for your heir. If rich and one
Of Inachus' old line and name,

Or poor and basest born, the same
Your doom to Orcus pitying none.
To the grim ferry all must go;
Our lots are cast into one urn,
And soon or late comes out our turn
For endless banishment below.

Carm. II. 9.

Nor ceaselessly the raincloud pours
Down on the tangled fields, nor yet
Do squalls the Caspian always fret,
Nor always on Armenian shores
Stands the stiff ice, nor all the year
Reel the stout oaks to winds that rave
Round Gargan heights, nor ash trees wave
Their leafless boughs for ever sere.
Why then lament with endless lay
Of Mystes reft? the star of eve
Shines on your grief, and still you grieve
When Hesper flies the hurrying day.
Not for his dear Antilochus
Mourned the old sire through livelong years
Nor Phrygian sisters poured their tears
Incessant o'er young Troilus.
Cease then, my Valgius, chaunt not ever
Those tender plaints; come change the string—
Of Cæsar's latest triumphs sing,
Niphates, and the Median river
Bound like the rest with Roman chains
And taught with tamer tide to flow,
And the Gelonians forced to know
Their bounds and ride o'er narrower plains.

Carm II. 14.

Ah me, my friend: how fast away
Fly the fleet years! no holy spell
Time or Time's wrinkles can repel,
Or Death's resistless march delay.

Pile up each day your hecatomb—
  Pluto heeds not! The giant brood,
  Vast Geryon, floating many a rood,
And Tityos writhe in ruthless doom,
Confined by that grim gulf below;
  And all who taste of earthly food
  Must cross that melancholy flood—
Princes and peasants all must go.
In vain from bloody wars we fly,
  And Hadria's roaring breakers shun:
  In vain shrink from the autumnal sun
And south winds breathing balefully;
That murky slow meandering river,
  Cocytus named, we all must view,
  And Danaus' dishonoured crew,
And him who heaves the stone for ever:
Abandoned land and home must be,
  And your sweet wife; of all your trees
  None but the hateful cypresses
May bear their brief lord company;
All your Cœcubian hoards your heir,
  Though guarded by a hundred doors,
  Shall waste, and stain his gorgeous floors
With finer wine than pontiffs share.

FROM LUCRETIUS.

Fond man, you've had of life your fill,—
  Why not like sated guest
Retire with a contented will,
  And safely take your rest?

FROM MARTIAL.

To-morrow I'll enjoy, you thoughtless say:
To-morrow comes too late, enjoy to-day.

ARROWSMITH, PRINTER, QUAY STREET, BRISTOL.